

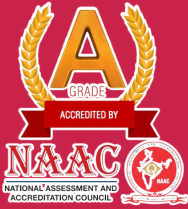


VINAYAKA MISSION'S  
RESEARCH FOUNDATION  
(Deemed to be University under section 3 of the UGC Act 1956)



AVMC  
AARUPADAI VEEDU MEDICAL COLLEGE

## BMSeCON 2023



13<sup>th</sup> - 15<sup>th</sup>  
December  
2023



*Organised by Departments of Anatomy, Physiology,  
Biochemistry & Centre for Biomedical Research*

Organize

**4<sup>th</sup> INTERNATIONAL e-CONFERENCE on**

**“Beyond Boundaries: Exploring Excellence in  
Basic Medical Sciences”**



### About Vinayaka Mission's Research Foundation (VMRF)

VMRF is a pioneering and vibrant Research Foundation (Deemed to be university) accredited with 'A' Grade by NAAC offers multi disciplinary courses in a multi-cultural environment with an ambience marked by harmony in diversity. The VMRF is committed to offer education in the most professional manner and ensures enormous growth potential to the students. One of the biggest Research Foundation in India, VMRF boasts of the most diversified education in terms of number of faculties ranging from Medicine, Allied Health sciences, Engineering and Technology to Management - almost an entire gamut of academic disciplines. VMRF's main campus in Salem, Tamil Nadu is truly a scenic marvel surrounded by mountains and is a hallmark in the city.

### About College (AVMCH)

The Aarupadai Veedu Medical College and Hospital was established at Pondicherry in the year 1999, with due approval from the Government of India and Medical Council of India. The Institution offers NMC recognized MD/MS programs in several disciplines in addition to MBBS program. AVMC campus is located in sprawling 100 acres and is home for a variety of flora and fauna. The eco-friendly, plastic and tobacco free campus is Wi-Fi enabled and houses Nursing, Physiotherapy and Allied Health Science colleges. Unique and distinguished program is also offered by BASLP. Presently 800 students are studying in the College. From 2020, 150 students are being admitted in the MBBS program.

### About Phase I MBBS Departments

All the 3 Phase I MBBS departments of AVMC were established in the year 1999. Major activities of the departments are teaching and research. Department of Anatomy has established a Plastination lab and organized several hands on workshops in Plastination techniques. Department of Biochemistry is known for adopting newer T-L methods. Department of Physiology has a Centre of excellence in Clinical Physiology and offers value added courses in nerve conduction, ECG and Pulmonary function testing. Multidisciplinary Centre for Biomedical research provides multi user, state of art equipment facility in the field of molecular biology. It also supports research activity in all departments and is responsible for initiating several internal and external research grants.

**4<sup>th</sup> INTERNATIONAL  
e-CONFERENCE BMS<sub>e</sub>CON 2023**



### About BMS<sub>e</sub>CON

We, the departments of Anatomy, Physiology and Biochemistry along with Centre for Biomedical Research from Aarupadai Veedu Medical College and Hospital, a constituent college of Vinayaka Mission's Research Foundation (VMRF) started the trend of conducting one international conference every year from the year 2020.

Our 1<sup>st</sup> International Conference conducted in 2020 emphasised on the emerging trends in Research in the field of Basic Medical sciences. This was among the very few academic events that took place in 2020 when all educational activities came to a grinding halt due to Covid restrictions. The 2<sup>nd</sup> international conference (2021) focused mainly on exploring newer modalities in teaching - learning and Research in Basic Medical Sciences during COVID era. Both conferences had around 1000 registrations. The 3<sup>rd</sup> International Conference was conducted in 2022 on the theme **"Role of Basic Medical Sciences in Academia, Diagnosis and Research Advancement"**. The highlights included Young Research Scholar Award presentations in Faculty, PhD, and Postgraduate categories, oral presentations in all categories and Poster competition for undergraduates. Apart from guest Lectures, there were panel discussion and e-workshop too. The number of registrations ranged from 800 - 1200 in the last 3 years

### About This Conference - BMS<sub>e</sub>CON 2023

It is our pleasure to host the 4<sup>th</sup> International e-conference on the theme **"Beyond Boundaries: Exploring Excellence in Basic Medical Sciences"** that will be conducted from 13<sup>th</sup>- 15<sup>th</sup> December 2023.

Basic medical Sciences form the strong foundation for the medicine and surgery and its allied specialties to build up. With the implementation of new CBME curriculum, research has gained more and more importance in undergraduate & PG curriculum. Diagnostic modalities in lab testing related to clinical biochemistry, immunology and molecular biology have advanced in leaps in last few years. Information on such recent advancements in diagnostics helps the medical fraternity to render better patient care services.

Basic research in molecular biology, immunology and cell biology provides an infinite amount of data and knowledge. Applied research uses that information to understand the pathophysiology of diseases and apply this knowledge for the betterment of patients. Research demands critical thinking, logical reasoning and creative application by exploring newer approaches, techniques and methods. Our Conference is planned to cover all these aspects.

This conference can serve as a wonderful platform for educationists, diagnostic consultants and researchers to share their experiences and findings which would be of great help for many other participants to gather, improvise and put into practice the novel and innovative ideas.

**4<sup>th</sup> INTERNATIONAL  
e-CONFERENCE BMS<sub>e</sub>CON 2023**



# ANATOMY ABSTRACTS

## Study on Smartphone Vision Syndrome in Smartphone Users: A Prospective Randomised Controlled Study

Abstract-1

**B Senthil Kumar, Associate Professor in Anatomy, Head - Central Research Laboratory for Biomedical Research.**  
**K Ezhil Vendhan, Professor in Ophthalmology, Vinayaka Mission's Kirupananda Variyar Medical College and Hospitals, Vinayaka Missions Research Foundation (DU), Salem-636308.**

**Introduction:** Recent International reports on ocular health shared that diplopia and dry eye are the prevalent ocular disorders caused by overuse of smartphone in young adults. Studies on smartphone usage in young adult's reports that the smartphone use begins at the age group ranges from 12-18 years old, were the minimum duration of smartphone use per day is 4-6 hours. The association between smartphone use and prevalence of ocular manifestations has recommended the need of health education programs on smartphone use and its ocular impacts. Increasing use of smart devices also can cause acute acquired comitant esotropia in adolescents.

**Aim:** To investigate the influence of smartphone reading on the ocular surface and to compare the influences of smartphone use on ocular symptoms, status of tear film stability and volume assessment.

**Materials and Methods:** This is a prospective randomized controlled study on volunteers who continued reading for 2 hours on different smartphone screens. A total of 100 volunteers above 18 years of age without any ocular diseases had participated in the study. A structured questionnaire was used to collect the details

of smartphone usage and the visual acuity, tear film stability and volume assessment test and Intraocular pressure (IOP) was taken as some of the parameters in the study.

**Results:** The continuous use to smartphone causes various problems, headaches, eye dryness, earache, fatigue, and musculoskeletal manifestations. The visual acuity, tear film stability and tear volume and IOP of both right and left eye was analysed and found to be statistically significant among the control and SPVS group. The ocular manifestations are noted and correlated with the duration of usage. The precautions were recommended further from the results of the study.

**Conclusion:** The prevalence of eye diseases is high in most of the age groups and it is important to educate about the adverse effect of smartphone usage in all categories. The study also suggests about the screen time limitation and usage of smartphones for young adults.

**Keywords:** Diplopia, Dry eye, Ocular manifestations, Screen use.

## Anatomical Variation of the Inferior Mesenteric Artery and its Clinical Correlation

Abstract-2

**VD Ashok Patarlapalli, Shilpa Bathla, Ranjeeta Hansdak, Pooja Jain, Anjoo Yadav**  
**Department of Anatomy, Lady Hardinge Medical College, New Delhi, India.**

Inferior Mesenteric Artery (IMA) is the ventral branch of abdominal aorta arising at the level of L3 vertebra. It nourishes the left side of colon till rectum. IMA and its branches play pivot anatomical landmarks in colorectal surgery. High or low ligation of the IMA is one of the crucial factors on which the patient's overall survival rate depends. An elderly female cadaver aged 64 years was dissected as per Cunningham's dissector as a part of MBBS teaching at Lady Hardinge Medical College, New Delhi, India. Abdominal vessels were carefully dissected, and variations were noted. The authors

in the present cadaveric case, found that the IMA divided into two terminal branches. The ascending branch emanated the left colic and sigmoidal artery whereas the descending branch continued as superior rectal artery. This was similar to type 2 pattern of Yada's classification. The expert knowledge of normal and variant Anatomy of abdominal aorta is of utmost importance to the interventional Radiologists, laparoscopic Surgeons, and Surgical Oncologist in succeeding surgery with minimal complications.

**Keywords:** Abdominal aorta, Colon, Yada's classification.



# Omphalocele and Gastroschisis

Abstract-3

**SP Vinutha, Assistant Professor, Department of Anatomy, JSS Medical College, JSSAHER, Mysuru, India.**  
**D Narayanappa, Professor, Department of Pediatrics, JSS Medical College, JSSAHER, Mysuru, India.**  
**GV Manjunath, Professor, Department of Pathology, JSS Medical College, JSSAHER, Mysuru, India.**

Omphalocele and Gastroschisis are the two main important anterior abdominal wall defects. Omphalocele refers to the herniation of the abdominal viscera through an enlarged umbilical ring and herniated viscera are covered by amniotic sac. Gastroschisis occurs when body wall closure fails in the abdominal region. As a result, intestinal loops herniate into the amniotic cavity through the defect, which usually lies to the right of the umbilicus. Omphalocele is a more common condition than gastroschisis, occurring in 1 per 4000 live births compared to 1 per 6000 for gastroschisis. During routine foetal autopsies conducted in the Department of Anatomy, JSS Medical College, Mysuru, India, a rare interesting case of anomalous foetus with absence of development of anterior abdominal wall were observed. In a female foetus of 22 weeks gestation, a case of omphalocele was observed, which showed the herniation of

the liver, stomach, intestines outside the abdominal cavity, and membranes were ruptured. In a male foetus of 22 weeks gestation, a case of gastroschisis was noted, which showed a portion of the liver, stomach, small intestine and large intestine. Gastroschisis tends to be an isolated anomaly, whereas omphalocele is frequently associated with chromosome abnormalities and other birth defects. Thus, the long-term prognosis for infants with gastroschisis is considerably better than that for infants with omphalocele, in whom a 50% to 60% survival rate and frequently chronic medical problems are seen. Pregnancy termination options should be discussed with the family depending upon the gestational age of the foetus.

**Keywords:** Developmental anomalies, Foetal autopsy, Herniated viscera.

# Congenital Kidney Anomalies Associated with Accessory Renal Artery: A Case Report

Abstract-4

**Shilpi Garg, Department of Anatomy, Lady Hardinge Medical College, New Delhi, India.**  
**Susmita Saha, Department of Anatomy, SGT Medical College, Gurugram, India.**  
**Prashant Kumar, Department of Anatomy, Lady Hardinge Medical College, New Delhi, India.**

Renal arteries arise as lateral branches of abdominal aorta just below the superior mesenteric arteries at the level of L1-L2 and divide into anterior and posterior branches near the hilum in 70% of individuals. Renal artery variations are common regarding their origin and can be associated with congenital renal anomalies.

During routine dissection for undergraduate teaching in Anatomy department, SGT medical college, Gurugram, India, accessory renal artery associated with polycystic kidney was observed in right kidney of a 60 years old male cadaver. Gross observations were carried out and appropriately photographed. The embryological and clinical implications of the observed variations are discussed.

Accessory renal arteries can arise due to the complicated development of kidneys and variations in their positional anatomy.

The complex development of kidneys through pro-nephric stage to meta-nephric stage and its ascent from pelvic to lumbar region with its simultaneous procurement of vascular supply explains the common variations in the vascular anatomy of kidneys along with congenital malformations. Polycystic kidney disease is one of the inherited disorder in which cluster of cysts develop in the kidneys and can lead to kidney failure.

The documentation of variations in the renal arteries and its association with congenital anomalies are important for surgeons and radiologists to avoid complications during diagnostic investigations or surgical approaches to the kidney.

**Keywords:** Abdominal aorta, Hilum, Renal anomalies.

# Unusual Variations in Gantzer Muscle and Neurovascular Structures of Forearm

Abstract-5

**Urvi Sharma, Department of Anatomy, All India Institute of Medical Sciences, Raipur, India.  
Suman Verma, Department of Anatomy, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India.**

Gantzer muscles are variant muscles present in anterior forearm arising from flexor digitorum profundus or flexor pollicis longus. They may cause compressive neuropathy affecting median nerve or anterior inter-osseous nerve (Kiloh Nevin syndrome). Dual origin of Gantzer muscle forms a tunnel which includes median nerve, this study reveals a unique anatomical scenario in which Gantzer muscle may compress and entrap portions of median nerve. The present study reports dual origin of gantzer muscles in the right anterior region of forearm during routine anatomical dissection. In lower one-third of arm, median nerve was lateral to the brachial artery and both pierced the gantzer muscle arising from the tendon of flexor digitorum profundus. After emerging out, median nerve lies medial to brachial artery and pierced another gantzer muscle. Two anterior inter-osseous artery were emerging from common inter-osseous artery which is a branch of ulnar artery. Later, both anterior

inter-osseous artery were anastomosing with posterior inter-osseous artery. This variation is clinically significant since symptoms of median nerve compression caused by comparable changes are sometimes mistaken with symptoms caused by more prevalent causes like radiculopathy and carpal tunnel syndrome. Thorough understanding of nerve variations is required for neurosurgeons. The noticed variation is particularly beneficial to hand surgeons since this unusual muscle serves as an anatomical reference for procedures in this region. The safety and effectiveness of surgery are improved by knowledge of nerve variations. To the best of our knowledge, this variant has not been mentioned in current medical literature.

**Keywords:** Digitorum profundus, Pollicis longus, Median nerve compression.

# An Immunohistochemical Study of CD83 Positive Dendritic Cell Density in Human Benign and Malignant Lesions of Cervix: A Prospective Study

Abstract-6

**Kalpna Ramachandran, Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Chennai, India.**

**Introduction:** Dendritic Cells (DCs) help the immune system recognize and categorize the infective antigens. The CD-83 is a specialized marker for mature DCs. The CD-83 positive dendritic cells show variations in different pathological conditions of the human cervix.

**Aim:** To study the pattern of distribution and morphology of CD 83 positive dendritic cells in benign and malignant lesions of Cervical tissue by immunohistochemical techniques.

**Materials and Methods:** A prospective study was conducted in Women aged of 35 to 50 years, who underwent hysterectomy. A total of 30 specimens were included. Immunohistochemical staining for mature CD83+DCs was carried out in the processed benign and malignant cervix specimens. The overall number and density of CD-83 positive DC sand was noted, assessed and their pattern of distribution was analysed in benign and malignant lesions of cervix.

The number of cells per 20 high power field was calculated. The data obtained was statistically analysed.

**Results:** Number of CD-83 positive DCs is significantly higher in the malignant specimens than the benign cervical tissues. Difference between the two groups was statistically significant. Overall sensitivity and specificity of CD-83 cervix is 100%, with zero false positivity. Positive predictive value of CD-83 is 100% for cervix.

**Conclusion:** In patients with in-determinate biopsy reports or in patients with cervical dysplasia where prognostication is inconclusive, the present study provides cut-off values of CD-83 DC densities for cervix, which would greatly aid the clinicians to predict the prognosis, grade the morbidity of disease and plan appropriate treatment.

**Keywords:** Cervical tissue, Immune system, Specimens.

# Anatomical Variation of Abductor Pollicis Longus in Central Indian population: A Cadaveric Study

**Vishwajit Deshmukh, Associate Professor, Department of Anatomy, AIIMS, Nagpur, India.**  
**Shweta Talhar, Associate Professor, Department of Anatomy, MGIMS, Sewagram, India.**  
**Gayatri Muthiyar, Additional Professor, Department of Anatomy, AIIMS, Nagpur, India.**  
**Payal Kasat, Assistant Professor, Department of Anatomy, Dr B C Roy Multispecialty Medical Research Center, Kharagpur, India.**  
**C Kirubhanand, Associate Professor, Department of Anatomy, AIIMS, Nagpur, India.**  
**Bharat Sontakke, Associate Professor, Department of Anatomy, AIIMS, Nagpur, India.**

**Introduction:** A triangular depressed area on the postero-lateral aspect of the wrist joint becoming more apparent on the extension of the thumb is the 'Anatomical snuff box'. This is bounded laterally by the Abductor pollicis longus and the Extensor pollicis brevis tendons. The variation in the insertion of extensor tendons of the forearm in the hand and wrist is an interesting phenomenon. A sound knowledge of such variations in extensor tendons is essential to know the consequence of tendon injury and further planning with the practical implementation of its repair. Variations are also crucial to a radiologist while reporting such cases and for an anatomist during dissecting a cadaver for educational purposes.

**Aim:** To investigate anatomical variations in APL tendon insertions in the Central Indian population.

**Material and Methods:** This study was done with 48 formaldehyde fixed forearms of Indian-origin cadavers with age groups ranging from 33 to 67 years. After splitting the extensor retinaculum, the first compartment of the extensor retinaculum was carefully dissected.

The tendon of APL was exposed. Variation in the insertion of APL was noted if present by tracing the tendon till its insertion.

**Results:** Out of 24 cadavers, 9 were females and 15 were males. APL muscle was found with the single tendon in 20 forearms, double in 09, triple in 08, and quadruple in 05 and the maximum number of tendons found was five in 06 forearms of the cadaver. The variation in the insertion of the APL tendon was also noted. In 93 % of hands (n=45), the APL tendon was inserted into the first metacarpal bone and in 7% (n=03), it was also inserted into the trapezium bone. No variation was noted in the Extensor pollicis brevis tendon, the companion tendon of APL.

**Conclusion:** It is imperative to know that there are accessory slips of the APL tendon, differing significantly from the standard textbook description. This study will raise awareness of such potential variation amongst operating surgeons for better management. Being ignorant about such variations may otherwise complicate the management of the diseased.

**Keywords:** Extensor tendons, Operating surgeons, Wrist joint.

# Variations in the Ventral Branches of Abdominal Aorta and its Clinical Importance: A Case Series

**Hemamalini, Department of Anatomy, JSS Medical College, Mysuru, India. DN Poonam, Department of Anatomy, JSS Medical College, Mysuru, India, HN Manjunatha, Department of Anatomy, JSS Medical College, Mysuru, India, NB Pushpa, Department of Anatomy, JSS Medical College, Mysuru, India, Anjali Adari, II year MBBS Students, JSS Medical College, Mysuru, India, Arshiya Garg, II year MBBS Students, JSS Medical College, Mysuru, India.**

Abdominal aorta gives three ventral branches which supply the derivatives of the foregut, midgut and hindgut respectively. Coeliac Trunk (CT) gives left gastric, splenic and common hepatic arteries. Superior mesenteric artery gives inferior pancreaticoduodenal, jejunal, ileal, ileocolic, right colic, middle colic branches. Inferior mesenteric artery gives left colic, sigmoidal and superior rectal arteries. Multiple variations in the ventral branches of abdominal aorta in three cadavers were observed during routine dissection of the abdomen region for undergraduate MBBS students. First variation, common hepatic artery divided into proper hepatic artery and gastroduodenal artery. Right hepatic artery was taking origin 1 cm below the bifurcation of the Common Hepatic Artery (CHA)

from the Gastro-Duodenal Artery (GDA), after passing posterior to the common bile duct entered the Calot's triangle. The Proper Hepatic Artery (PHA) continued as left hepatic artery. Second variation, superior mesenteric artery (SMA) gave a common trunk which divided into right colic artery (RCA) and middle colic artery (MCA). MCA supplied right two-thirds of transverse colon whereas left one-third of transverse colon was supplied by a separate branch arising proximal to the middle colic artery from the common trunk - accessory middle colic artery (AMCA) which was anastomosing with the left branch of MCA and ascending branch of the left colic artery. Third variation, Inferior mesenteric artery (IMA) trifurcation - Left colic, sigmoidal and superior rectal arteries arising from same



point. Fourth variation, CHA trifurcated into Right Hepatic Artery (RHA), Left Hepatic Artery (LHA) and gastro-duodenal artery and RHA gave two cystic arteries to gall bladder.

**Conclusion:** Preoperative radiological evaluation of variations in the branching pattern of CT and SMA, their importance are essential

in minimising intraoperative bleeding during cholecystectomy, pancreatico-duodenectomy, pancreas transplant, splenic flexure mobilisation and colectomy.

**Keywords:** Accessory middle colic artery, Calot's triangle, Gut supply.

## Unravelling the Anatomy of Anterior Tarsal Tunnel with Clinical Implications

Abstract-9

**T Jahira Banu, Senior Resident, Department of Anatomy, JIPMER, Puducherry, India.**  
**Nithya Dhakshnamoorthy, Junior Resident, Department of Anatomy, JIPMER, Puducherry, India.**  
**Sulochana sakthivel, Additional Professor, Department of Anatomy, JIPMER, Puducherry, India.**

**Introduction:** Anterior tarsal syndrome is caused by compression of the Deep Fibular Nerve (DFN) beneath the inferior extensor retinaculum while traversing between the tendons of the extensor hallucis longus and extensor digitorum longus. This compression may result from direct trauma, repetitive mechanical irritation, and aneurysms/thrombosis of the Dorsalis Pedis Artery (DPA). In addition, these neurovascular structures are prone to injury during ankle arthroscopy.

**Aim:** To describe the anatomy of the anterior tarsal tunnel and its contents with their clinical implications.

**Materials and Methods:** Twenty lower limbs from 10 formalin-fixed cadavers were examined. The limbs that showed no evidence of pathology or trauma were included. The boundaries of the anterior tarsal tunnel, the branching pattern of DFN and its relation to the DPA within the tunnel were assessed.

**Result:** The mean length of the medial border of the tunnel was  $27.33 \pm 9.94$  mm, while the lateral border was  $19.58 \pm 4.78$  mm. Variable patterns of the DFN and its branches were observed and they were related to the DPA, either laterally or medially within the tunnel. These patterns and additional data will be discussed in the conference.

**Conclusion:** The present study describes the anterior tarsal tunnel and provides insight into the patterns of DFN and DPA in the tunnel. Understanding the anatomy of the anterior tarsal tunnel facilitates safe and efficient surgical procedures for managing anterior tarsal syndrome and mitigates the risk of neurovascular damage during ankle arthroscopy. Additionally, it aids in the accurate diagnosis of peripheral nerve pathology.

**Keywords:** Extensor digitorum longus, Extensor hallucis longus, Deep fibular nerve.

## Renal Pelvis and Ureter: Its Incidence, Types, and Applied Importance: A Cadaveric Study

Abstract-10

**Ankana Saha, Department of Anatomy, University College of Medical Sciences, Delhi, India.**

**Introduction:** The ureters are muscular ducts, around 25-30 cm in length, with narrow lumina. These ureters drain urine from the corresponding kidney to the urinary bladder. The ureters have two segments: abdominal and pelvic. Congenital anomalies of the kidney and urinary tract including double ureter are uncommon developmental anomalies.

**Aim:** To study the pattern of pelvis and ureter in human cadavers.

**Materials and Methods:** A total of 40 kidney and ureter specimens were carefully dissected out of the posterior abdominal wall and examined for the presence and sub-type of double ureter. The anatomy of renal pelvis and branching pattern of ureter were observed and noted.

**Results:** Of 40 kidneys, only one specimen showed an incomplete double ureter and it is on the right kidney. In the specimen, the double ureter fused at different levels to form a single ureter opening into the bladder.

**Conclusion:** The prevalence of incomplete double ureter is average in this study compared with that in previous cadaveric studies. Ureteral injuries are a frequent complication of abdominal and pelvic surgeries. Hence, awareness about the types and varieties of ureters will aid radiologists and surgeons in interpreting and diagnosing urological images and preventing accidental injury while performing surgery.

**Keywords:** Congenital anomalies, Kidney, Urinary bladder.

# Luschka Fork Rib: A Rare Anatomical Variant

Abstract-11

**Najma Mobin, Department of Anatomy, JSS Medical College and Hospital, JSS Academy of higher education and research, Mysore, India.**

Bifid ribs are due to incomplete fusion or anomalous chondrification of the cephalic and caudal segments of sclerotome during fourth to sixth weeks of development. Fork ribs are very rare entity and are discovered incidentally either by radiological or cadaveric methods. It occurs in 1.2% of population, usually unilateral and its overall prevalence is 0.15-3.4% (mean 2%), it accounts for 20% of all congenital anomalies of the ribs. During routine osteology class for undergraduate medical students on ribs, it was observed that the anterior end of the 4<sup>th</sup> rib was bifurcated. The two limbs of the bifurcated rib was making an angle of 60°. The rib belonged to the right side and of a female cadaver.

The description of the anomalies of the ribs is very minimal in the literature, their incidental finding through chest X-rays is usually

associated with various underlying clinical syndromes. The Luschka's forked rib is most commonly found to be associated with Gorlin – Goltz syndrome or Nevoid basal cell carcinoma syndrome which is an autosomal dominant with prevalence of one in 57,000 cases. It is also seen associated with Job's syndrome, Kindler syndrome and other malignancies in children. Anatomical knowledge of such a rare entity is essential for surgeons operating on anterior thoracic wall involving rib cage. Since it is in close association with childhood malignancies like Gorlin syndrome, its early radiological detection can reveal the underlying malignancies especially in children and preventive measures can be taken at an early stage.

**Keywords:** Chest x-rays, Gorlin-goltz syndrome, Nevoid basal cell carcinoma.

# Correlation between 2D:4D Ratio and Neck Circumference in Young Females of Haryana

Abstract-12

**Shveta Swami, Professor, Department of Anatomy, Kalpana Chawla Government Medical College, Karnal, Haryana, India.**  
**Deepak Sharma, Consultant, Park Hospital, Karnal, Haryana, India.**

**Introduction:** Second to fourth digit ratio (2D:4D ratio) is a sexually dimorphic biometric marker. It is influenced by pre-natal estrogen and testosterone levels. If 2D:4D ratio is associated with testosterone and estrogen levels it may correlate with risk of Myocardial Infarction (MI) (MI). In past literature, its shown 2D:4D ratio in relation to measures of body shape and body fat distribution and found some support for an early organizational effect of sex hormones through the association between indices of female body shape, male Body Mass Index (BMI), and human finger length patterns.

**Aim:** To find out the correlation between neck circumference and 2D:4D ratio in young females of Haryana region of India.

**Materials and Methods:** This study was conducted at BPS, GMC for Women Khanpur Kalan, Sonapat, Haryana, India, on 250 females of Haryana population having age group 17-35 years. The following

anthropometric measurements were obtained with the participants: height, weight, 2d:4d ratio, neck circumference. The data was collected, tabulated and subjected to statistical computation.

**Results:** A positive correlation between 2D:4D ratios (a putative marker for prenatal T) and NC was found in the study.

**Conclusions:** The suggested that digit ratio is indicative for being overweight in women and may thus be an additional simple screening measure. Being overweight and/or obese is a high-risk factor for Coronary Heart Disease (CHD) associated with NC. The present findings of positive correlations between 2D:4D ratios and NC in women of Haryana region suggest a possible predisposition towards CHD.

**Keywords:** Biometric marker, Obese, Over-weight.

# Estimation of Direct Attainment of Course and Program Outcome for Outcome based Education in Anatomy

Abstract-13

**K Pushpalatha, Department of Anatomy, JSS Medical College, Mysore, India.**

**Introduction:** Outcome Based Education (OBE) has become the standard of practice in Higher Education Institutions. Since the concept of OBE was relatively new, some may find that the assessment for OBE is rather cumbersome and will take a lot of energy in keeping track of students for every course at any given time. This must be done continuously for as long as the program needs to be accredited.

**Aim:** To calculate the attainment of Course outcomes.

**Materials and Methods:** The course outcomes (07) and program outcomes (09) were prepared and validated; course outcome was aligned to program outcome. The flow of measurement is taken from internal assessment marks, the marks are then converted whether they meet the course outcome. Their performance is tabulated and analysed using MS excel software. After getting the

course outcome score, the contribution of each course to program outcome was measured. Each individual student needs to get at least 50% of marks associated with the course outcome to be said as achieving it.

**Results:** Course outcome attainment is CO1-75.95%, CO2-78.16%, CO3-75.85%, CO4-73.66%, CO5-82.75%, CO6-91.59% and CO7-93.44%. Anatomy course outcomes are maximum mapped with PO1 and PO2, and their attainment is above 70%.

**Conclusion:** Program outcome measurement can ensure the students' produced has been included in continuous quality improvement process and therefore by the very meaning of OBE, students should be getting better from time to time.

**Keywords:** Accredited, Assessment, Higher educational institutes.

# Anatomical Study of Sacral Hiatus in Dry Adult Human Sacra and its Clinical Relevance in Caudal Epidural Block

Abstract-14

**C Divya, Meera Jacob, Department of Anatomy, Yenepoya Medical college, Mangalore, India.**

**Introduction:** Caudal epidural block is widely used as diagnostic as well as therapeutic tool in lumbar spinal disorders by orthopaedic surgeons. Correct localisation of the sacral hiatus is essential for administering a successful caudal epidural block.

**Aim:** To assess the anatomical variation of sacral hiatus with its other bony landmarks to improve reliability of caudal epidural block.

**Materials and Methods:** A total of 150 dry human sacra of irrespective sex were studied for anatomical variation of sacral hiatus. Various parameters of the sacrum studied were as follows: the shape of the hiatus, length of the sacral hiatus, transverse width at the base and antero-posterior diameter at the level of the apex. For each parameter, the mean value, standard deviation, range and percentage of bones identified correctly were calculated.

**Results:** Various shapes of sacral hiatus were observed, including inverted "U" in 54%, inverted "V" in 24%, irregular in 8%, elongated in 7% and dumbbell-shaped in 6%. Absent sacral hiatus was observed in 1%. The mean value for the length of sacral hiatus from the apex to the mid-point of the base was found to be 23.2 mm, transverse width at the base of hiatus was 14 mm, antero-posterior diameter of the sacral canal at the apex was 4.34 mm.

**Conclusion:** Clear understanding of the normal anatomy of sacral hiatus and its variation may be one of the important key factors for successful caudal epidural block.

**Keywords:** Anomalies, Diagnostic, Therapeutic tool.



# Morphometry of Nutrient Foramina of Human Fibula Bones of Leg and its Clinical Relevance

Abstract-15

**A Ahmad, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**A Anand, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**R Biswas, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**N Verma, Department of Physiology, King George's Medical University, Lucknow, Uttar Pradesh, India.**

**Introduction:** The nutrient foramina of bones is useful for surgical procedure such as microvascular bone grafts to preserve the circulation.

**Aim:** The objective of present study is to study the morphology of nutrient foramina in bony specimens which is helpful for clinicians involved in vascular bone grafts.

**Materials and Methods:** The study was conducted in total 100 bones including 50 tibia and 50 fibula (25 of each side). The study was conducted using osteometric board for measuring the length of the bone along with the location of nutrient foramina and the calculation of foraminal index. The nutrient foramina were seen through naked eyes in natural light. The material collected for this

study was from the Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.

**Results:** The nutrient foramina in case of tibia, 99.6% showed single foramen and in 2.5% cases it was absent. With respect to fibula 90.2% had single foramen and 8.4% has no foramen while in 1.4% cases there were multiple foramina.

**Conclusion:** The study provides information about the morphometry of nutrient foramina in lower limb leg bones. The foramina of tibia were commonly observed at its upper part, whereas in fibula they were present in the lower part. This provides information during surgical procedures.

**Keywords:** Foraminal index, Micro-vascular, Morphology

# Trochlear Extensions of Talus Bone in Population: A Cross-sectional Study

Abstract-16

**R Biswas, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**A Anand, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**A Ahmad, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.**  
**N Verma, Department of Physiology, King George's Medical University, Lucknow, Uttar Pradesh, India.**

**Introduction:** The talus is a tarsal bone articulated with the tibia, fibula, navicular, and calcaneus bones to form supra-talar, pre-talar, and subtalar joints, respectively. A squatting facet is a kind of anomaly that forms on the surfaces where the tibia and talus articulate. The trochlear extension states the daily activities and living style of society. Squatting is described as the hyperflexion of the hip and the knee and the movement of hyper-dorsiflexion between the leg and the ankle.

**Aim:** The present study was done to find out variations and incidences of various types of modifications of neck of talus thoroughly and to determine regional peculiarities of these modifications in Indians.

**Materials and Methods:** In the present cross-sectional study, 1200 dry adult human tali were taken from the osteology laboratory

in the Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India. Ethical clearance was obtained from the Institutional Ethics Committee, King George Medical University, Lucknow, as ref. code: 121 ECMIIA/P3.

**Results:** The authors in the present study observed that the lateral, medial, and continuous trochlear extensions are 252 (21.12%), 240 (20.58%), and 62 (5.36%), respectively, in the Indian population.

**Conclusion:** Modifications of the neck of the talus (trochlear extensions) are the result of prolonged squatting positions, which is a common habit of the Indian population, and incidences of these variations can be used as an anthropological marker for racial and regional differentiation of un-identified bones.

**Keywords:** Articulation, Tibia, Trochlear extensions.

# Fusion of the Median and Musculocutaneous Nerve in the Upper Extremity: A Case Report

Abstract-17

**S Nidhi, Department of Anatomy, Yenepoya Medical College, Mangalore, Karnataka, India.**  
**A Divia Paul, Department of Anatomy, Father Muller Medical College, Mangalore, Karnataka, India.**  
**Aishwarya Thambi, Department of Anatomy, Yenepoya Medical College, Mangalore, Karnataka, India.**

The musculo-cutaneous nerve is a mixed branch of lateral cord of brachial plexus which provides motor innervation to muscles of the anterior compartment of arm. It provides sensory innervation to lateral part of forearm. It courses through the anterior part of the arm, after passing at the lateral edge of tendon of biceps brachii, it becomes known as the lateral cutaneous nerve of the forearm. After dissection of the upper extremities in a male cadaver, variations of the musculocutaneous and median nerve were found on left side. Fusion of musculocutaneous nerve with median nerve after piercing coraco-brachialis muscle was found. Venieratos D et al., have

noted three types of communications between the MCN and MN in relation to the coraco-brachialis muscle. The communications have been broadly classified by Choi D et al into 3 types, out of which type 1 indicates fusion of musculocutaneous and median nerve. Knowledge of these variations is important for planning surgeries in the axilla. Musculocutaneous nerve injury causes weakness in the shoulder and flexion of elbow, atrophy of biceps brachii and paresthesia at the lateral part of forearm. Tasks like lifting a cup and brushing our teeth can become very difficult if the nerve is injured.

**Keywords:** Biceps brachii, Brachial plexus, Tendons.

# Exploring Morphological Variations and Clinical Significance of Interconnections between Flexor Hallucis Longus and Flexor Digitorum Longus Tendons: Cadaveric analysis

Abstract-18

**Apurba Patra, Department of Anatomy, All India Institute of Medical Sciences, Bathinda, India.**  
**Harsimarjit Kaur, Department of Anatomy, Government Medical College, Patiala, India.**  
**Adil Asghar, Department of Anatomy, All India Institute of Medical Sciences, Patna, India.**  
**Priti Chaudhary, Department of Anatomy, All India Institute of Medical Sciences, Bathinda, India.**  
**NB Pushpa, Department of Anatomy, JSS Medical College, JSSHER, Mysore, India.**  
**KS Ravi, Department of Anatomy, All India Institute of Medical Sciences, Gorakhpur, India.**

**Introduction:** The tendons of the flexor hallucis longus (FHL) and Flexor Digitorum Longus (FDL) are commonly utilized in reconstructive foot surgery to address deformities. These tendons intersect on the plantar surface and exhibit varying interconnections that can significantly impact graft length and complicate the tendon harvesting process.

**Aim:** To comprehensively categorise these interconnections using a modified classification system and precisely determine their positional relationships with surgically significant bony landmarks.

**Materials and Methods:** Sixty embalmed feet of 30 cadavers were studied to analyse the interconnections between FHL and FDL in the planta pedis, classify them in a modified classification system and measure distances to surgically relevant anatomic landmark.

**Results:** The study revealed three primary types of interconnections. Type I, representing a proximal-to-distal connection from the FHL

to the FDL, was observed in 85% of the feet. Type II, signifying a proximal-to-distal connection from the FDL to the FHL, was found in 11.66% of the feet. Type III, characterized by a crossed connection, was identified in 3.33% of the feet. The average point of branching for the FHL and FDL tendons was situated 4.5 cm and 3.5 cm distal to the navicular tuberosity, respectively.

**Conclusion:** The presence of atypical proximal-to-distal interconnections from the FHL to the FDL may play a role in preserving residual function in the lesser toes following FDL transfer procedures. Awareness of anatomical variations in the location of these interconnections is crucial for preserving them during surgical interventions, ultimately mitigating the risk of functional impairment in the lateral toes post-tendon grafting.

**Keywords:** Reconstructive foot surgery, Interconnection, Tendon grafting.

# Vascular Foramina of Talus: Dry Bone Study

Abstract-19

**A Anand, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.  
R Biswas, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.  
A Ahmad, Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India.  
N Verma, Department of Physiology, King George's Medical University, Lucknow, Uttar Pradesh, India.**

**Introduction:** The keystone of medial longitudinal arch is talus which act an osseous link between the foot and leg. Avascular Necrosis (AVN) is late complication of fracture of talus. To determine the vascular foramina may help in understanding the vascularity of different surfaces of talus. Hence the knowledge of distribution of nutrient foramina in talus is helpful in estimating the risk of vascular damage during surgical approaches and the likelihood of AVN.

**Aim:** To describe the distribution of nutrient foramina, numerically, on each surface of talus neck and body.

**Materials and Methods:** The study was conducted on 600 dried human tali obtained from osteology laboratory of Department of Anatomy, King George's Medical University, Uttar Pradesh, Lucknow, India. The vascular foramina on each surface of neck and

body of talus was counted by passing K wire with a diameter of 0.5 mm and by using hand lens.

**Results:** The authors in this study, observe that the maximum number of vascular foramina were present on inferior surface of neck in comparison to its lateral surface while maximum number of vascular foramina present on medial surface of body in comparison to its lateral surface of talus bone.

**Conclusion:** The knowledge of distribution of vascular foramina is important to the orthopaedic, vascular and podiatric surgeons. The lateral approach would be more favourable in the surgical interventions to talus due to minimum number of vascular foramina with respect to other surfaces.

**Keywords:** Avascular necrosis, Medial longitudinal arch, Nutrient foramina.

# Morphological Study of Suprameatal Depression and Spines in Dried Human Skulls

Abstract-20

**Suman Yadav, Department of Anatomy, Pt. B D Sharma PGIMS, Rohtak, Haryana, India.  
Usha Verma, Department of Anatomy, Pt. B D Sharma PGIMS, Rohtak, Haryana, India.  
Pooja Rani, Department of Anatomy, Pt. B D Sharma PGIMS, Rohtak, Haryana, India.  
Shavi Garg, Department of Anatomy, SGT University, Gurugram, Haryana, India.  
Ritu Singroha, Department of Anatomy, Pt. B D Sharma PGIMS, Rohtak, Haryana, India.**

**Introduction:** The suprameatal triangle is a depression situated immediately behind and above the external acoustic meatus. It is formed by the squamous temporal. Suprameatal depression may show a bony spine or crest in its anterior margin, the suprameatal spine which varies in shape, size and position.

**Aim:** To study the morphological variations of suprameatal depression and spines in human skulls.

**Materials and Methods:** The study was conducted in the Department of Anatomy, S.G.T. Medical College, Gurugram and Pt. B.D. Sharma PGIMS, Rohtak, Haryana, India. Morphology and morphometric parameters of temporal bones of both sides were studied in 120 dry adult human skulls of known sex. Dry adult human

skull with at least one side intact temporal bone were included for the study. Foetal skulls and skulls with bilaterally broken temporal bone were excluded.

**Results:** The most prevalent type of suprameatal spine was crest type, found both in male and female skulls compared to triangular type of total skulls. Suprameatal depression was absent 9.6% skulls, deep in 49.2% and shallow in 41.2% skulls.

**Conclusion:** The suprameatal spine is an important surgical landmark and is of great importance to ENT surgeons and neurosurgeons in surgical approaches.

**Keywords:** Crest, External acoustic meatus, Bony spines.



# Bilateral Trifurcation of External Carotid Artery Concurrent with Variations in Auriculotemporal Nerve and Middle Meningeal Artery

Abstract-21

**Priyanka Clementina Stephen, Nikilesh Sankaran, Ambiga Raman, Suman Verma, HY Suma.**  
**Department of Anatomy, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India.**

Trifurcation of External Carotid Artery (ECA) is an incidental and rare finding. Variable terminal branching can complicate embolisation procedure in ECA. The Auriculo-temporal Nerve (ATN) usually arises by two roots and it may have variable roots ranging from 1- 5. Course of middle meningeal artery (MMA) in front of the ATN can lead to nerve compression. During routine dissection of a male cadaver in the department of Anatomy, the following variations were observed bilaterally. On the right side, ECA trifurcated into superficial temporal, maxillary artery, and a third branch continued as the MMA. ATN formed a loop and passed behind the MMA. On the left side, ECA trifurcated into superficial temporal, maxillary artery, and a third branch that divided into the MMA and inferior

alveolar artery. ATN had a single root and it passed behind the middle meningeal artery. The possibility of a trifurcated ECA has to be taken into account by surgeons while performing parotid surgery and maxillofacial surgeries. The possibility of compression of the ATN while the MMA passes in front of it has to be considered in patients with auriculotemporal neuralgia. The knowledge of these variations will be useful for surgeons and radiologists while treating auriculo-temporal neuralgia and also in head and neck surgeries. The variation of the terminal branching pattern of external carotid artery will be useful in transcatheter embolization procedures.

**Keywords:** Parotid surgery, Maxillofacial surgery, Variable terminal branching.

# Anatomical and Radiological Assessment of Sacral Hiatus and its Implication in Caudal Epidural Block and Low Back Pain

Abstract-22

**Chandra Philip X, Professor, Department of Anatomy, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth, Puducherry, India.**

**Introduction:** Sacrum is a large triangular bone wedged between the two hip bones. Raised interrupted crest in the median plane which bears four spinous tubercles is called median sacral crest. An inverted U shaped gap below the fourth spinous tubercle is called sacral hiatus. It is due to failure of lamina of fifth sacral vertebra to meet in the median plane. It is used as a landmark to give caudal epidural analgesia. Anatomical variations of sacral hiatus will lead to failure in caudal epidural analgesia.

**Aim:** To locate Sacral hiatus precisely using different parameters and to identify any association between sacral hiatus of dry sacral bone with radiograms of patients with low back pain.

**Materials and Methods:** Fifty-two radiographs (30 male, 22 female) were obtained from Radiology Department MGMCRI, Puducherry, India. The above radiographs were of patients with low back pain. Each sacrum was studied with regards to the shape of the hiatus and location of apex of the hiatus. Sixty undamaged sacra of unknown sex and age were studied from Anatomy Department MGMCRI. Various parameters were studied using a vernier caliper with 0.1 mm accuracy: Shape of the hiatus, level of apex of hiatus, level of base of hiatus, length of hiatus, depth at apex, width of

hiatus at base. Distance between two supero-lateral crest, distance between right supero-lateral crest and apex, Distance between left supero-lateral crest and apex.

**Results:** The observations noted for the 52 radiographs in this study are Average Shape: Inverted U shape (63%), Position of apex: S4 vertebra (80%), Position of base: S5 Vertebra (90%), Average length: 2.4 cms, Average width: 1.5 cms, Depth at apex: 0.6 cms, Distance between two supero-lateral crest: 6.4 cms, Distance between right supero-lateral crest and apex: 6.8 cms, Distance between left supero-lateral crest and apex: 6.8 cms. Radiographic study: Average Incidence of apex of the sacral hiatus: S4 level (M:14(46.6%), F:12 (54.5%), Deficient dorsal wall: 12(M:40%,F:6(27.2%).

**Conclusion:** The radiological study coincides with the observations made in the dry human sacra except for the patients with low back pain had high percentage of deficient dorsal wall. Precise knowledge of anatomical variations of sacral hiatus increases the success rate of caudal epidural anesthesia.

**Keywords:** Dry human sacra, Sacrum, Spinous tubercle.

# Morphology of First Extensor Compartment Tendons and its Potential Role in First Carpometacarpal Joint Arthritis

Abstract-23

Rituraj Majumder, Gomathi Ramakrishnan, Suman Verma

Department of Anatomy, Jawaharlal Institute of Post Graduate Medical Sciences and Research, Puducherry, India.

**Introduction:** The first extensor compartment has Abductor Pollicis Longus (APL) and Extensor Pollicis Brevis (EPB) tendons. The extra tendons may narrow the compartment and predispose to tenosynovitis. Variations in insertion may cause thumb base joint instability. The literature on APL and EPB morphology in South Indian population is limited, hence the study was planned.

**Aim:** To observe the morphology of APL and EPB tendons and to assess its association with trapezio-metacarpal arthritis.

**Materials and Methods:** Upper limbs from 8 formalin embalmed cadavers and 42 disarticulated limbs available in the Department of Anatomy were used. The first extensor compartment was exposed to identify the number of APL and EPB tendons and site of insertion. The presence of septum and the distance of its proximal limit from radial styloid process was noted. The articular surfaces of trapezio-metacarpal joint were examined for arthritic changes. The results were statistically analysed.

**Results:** Two APL tendons were most commonly seen, a single tendon was noted in 25%, triple in 14%, four in 7%, five in 4% and six in 2%. APL tendons inserted on metacarpal base in 64%, on trapezium in 25% and thenar muscles in 11%. EPB was absent in 3.4%. It inserted on distal phalanx in 24%. Septum was noted in 48% and its average distance from radial styloid process was  $16.57 \pm 5.7$  mm. A significant association was seen between presence of trapezio-metacarpal arthritis in wrists with greater than 2 tendons of APL ( $p$ -value=0.03).

**Conclusion:** Extra APL tendons may vary from 2 to 6 in Indian population and are associated with arthritic changes in base joint of thumb.

**Keywords:** Abductor pollicis longus, Extensor pollicis brevis, Tenosynovitis

# Maternal Anthropometry as a Predictor of Newborn Health

Abstract-24

Dr. Nagaraj Mallashetty, Associate Professor Department of Anatomy SSIMS and RC Davangere, Karnataka, India.

**Introduction:** Maternal anthropometry has an impact on both maternal pregnancy and foetal health. Evaluation of anthropometry of nutritional status during reproductive cycle, particularly during pregnancy is widely used low technology procedure that is expected to generate much valuable information.

**Aim:** To obtain a correlation between the anthropometric measurements of mother ie height, weight, Body Mass Index (BMI), mid upper arm circumference and head circumference with corresponding variables of the newborn at full term.

**Materials and Methods:** Two month study was conducted on 50 full term pregnant women and their offspring. Normal delivery cases were considered and any factor that caused the alteration of anthropometry of newborn were excluded from the study. Individual parameters used are height, weight, BMI, mid upper arm circumference and head circumference. Statistical analysis was done using pearson product moment correlation coefficient ( $r$ ) and scatter diagram.

**Results:** Among 50 full term pregnant women who met the eligibility criteria, mean and standard deviation of maternal weight was 65.52(13.52) and birth weight was 2.9(0.391) kg, maternal height was 1.54(0.095) m and length of the newborn was 0.48(0.041)m, maternal BMI was 28.1(4.88) kg/m<sup>2</sup> and neonatal BMI 13.26(2.59) kg/m<sup>2</sup>, maternal mid upper arm circumference was 0.28(0.043) m and mid upper arm circumference of newborn was 0.08(0.011) m, maternal head circumference was 0.56(0.028)m and head circumference of newborn was 0.33(0.023)m. The  $r$  values for weight was 0.199, height 0.236, BMI 0.13, mid arm circumference 0.188 and head circumference was 0.037.

**Conclusion:** A positive correlation exists between maternal anthropometric features and their offspring. It is suggested that birth weight, length, BMI, mid upper arm circumference for some extent be given importance as essential indicators for monitoring and evaluating maternal and child health programs.

**Keywords:** Arm circumference, Foetal, Head circumference.

# Effects of Weight Reduction and Therapeutic Exercises in Reducing the Severity of the Flat Foot: An Interventional Study

Abstract-25

**K Vijayakumar, Department of Anatomy, Symbiosis Medical College for Women (SMCW), Pune, India.**  
**S Senthil kumar, Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Symbiosis International (Deemed) University (SRIHER), Porur, Chennai, India.**  
**Mandar Ambike, Department of Anatomy, Symbiosis Medical College for Women (SMCW), Symbiosis International (Deemed) University, Pune, India.**

**Introduction:** Obesity is one of the significant causes of the development and progression of the flat foot. No studies have, however, identified the mechanism by which obesity affects the arches of the foot.

**Aim:** To find the efficacy of weight reduction and muscle strengthening exercises along with lifestyle modifications in reducing the severity of the flat foot.

**Materials and Methods:** A total number of 72 participants (44 cases and 28 control) aged between 25-45 years were analysed based on the Body Mass Index (BMI) and foot assessment was performed using a self-designed foot scanner and parameters.

**Results:** To determine the effectiveness of the intervention, the paired t-test was used.  $p < 0.05$  was used as the criterion of significance for all tests. Results showed a positive change in the arches of the foot and that the given intervention is found to be effective.

**Conclusion:** The present study concludes that obesity is one of the causative factors for the development of flatfoot. Lifestyle modifications comprising diet patterns, weight loss and arch strengthening exercises helps in reducing the severity of the flat foot.

**Keywords:** Foot arch, Obesity, Lifestyle modifications.

# Landmarks and Measurements for Endoscopic Approach through Kambin's Triangle

Abstract-26

**B Manisha Sinha, Department of Anatomy, AIIMS, Raipur, Chhattisgarh, India.**

**Introduction:** Chronic back pain and sciatica are resulted from compression of nerve root owing to lumbar vertebral degeneration. Treatment plan for these patients are lumbar disk herniactomy or palliative care by introducing analgesic form Kambin's triangle.

**Aim:** To measure the dimension of boundaries of Kambin's Triangle (KTs) and give the size of cannula to introduce in that space without compromising the functions of structure in the vicinity.

**Methods:** Seven human KT from (three males and four female) were taken for measurements. Dissection was done to carefully clear landmarks, including the vertebral bodies, intervertebral disc, exiting nerve root, and superior articular process. Base (a horizontal plane passing through the superior border of the caudal vertebra) and height (along the superior articular process of the inferior vertebra in line with the articular facet) were taken with digital vernier

caliper. Hypotenuse, semi-perimeter of the triangle, area of triangle, diameter, and area of the inscribed circle were calculated.

**Results:** Disc space from L1-L2 to L4-L5 were gradually increased so the height, base, and inscribed circle diameter. L5-S1 space showed decrease in height, base and inscribed circle diameter. The safest admissible cannula diameter according to the current study that can be used at all levels in KT was 6.06 mm.

**Conclusion:** The largest cannula diameter of bony Kambin's triangle is 6.06 mm or smaller can be used at all levels in the KT. This study will benefit neurosurgeons, spine surgeons, orthopedics, and pain physicians in planning their procedures and deciding the appropriate cannula diameter for minimally invasive.

**Keywords:** Compression nerve root, Pain physicians, Sciatica.

# Unveiling The Microworld: Exploring Testicular Microcalcifications and their Clinical Significance: A Rare Case Report

M Kavitha, Department of Anatomy, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.

Testicular microcalcification refers to the presence of tiny, often microscopic, calcium deposits within the testicles. These calcifications can manifest as small, dense spots on imaging studies such as ultrasound scans. The identification and interpretation of testicular microcalcifications are crucial for healthcare providers, as they may influence decisions related to diagnosis, treatment, and patient care. Further research is continually being conducted to enhance our understanding of the causes and consequences of testicular microcalcifications and its clinical significance. Since this doesn't have a permanent cure and it comes under a rare case. A 27-year-old patient, otherwise healthy male sought medical attention for a routine health check-up. During a scrotal ultrasound aimed at assessing a mild discomfort reported by the patient, unexpected findings of testicular microcalcifications emerged. The microcalcifications were dispersed throughout the testicular parenchyma and detected in both testicles. To understand the implications of the testicular microcalcifications, a series of diagnostic tests were employed. Hormonal assays, serological tests, and a detailed medical history were obtained. The patient reported no history of trauma, infections, or known medical conditions.

Hormonal profiles were within normal limits, ruling out endocrine abnormalities. Imaging studies, including a contrast-enhanced Magnetic Resonance Imaging (MRI) scan, were conducted to further evaluate the extent and distribution of the microcalcifications. The MRI confirmed the presence of dispersed microcalcifications throughout the testicular tissue, with no apparent signs of mass lesions or structural abnormalities. Given the absence of symptoms, normal hormonal profiles, and the lack of significant abnormalities on imaging, a conservative approach was adopted. Regular follow-up appointments were scheduled to monitor any changes in symptoms or the appearance of new clinical findings. This case highlights the importance of a thorough investigation in cases of testicular microcalcification, even in the absence of apparent symptoms. While often benign, a comprehensive evaluation is essential to rule out underlying conditions and determine the appropriate course of management. Further research and long-term follow-up studies are crucial to enhance our understanding of the clinical significance and potential implications of testicular microcalcifications.

**Keywords:** Calcification, hormonal assays, ultrasound scans.

# Radiological Evaluation of the Anatomy of the Trochanteric Fossa as an Entry Point for Intramedullary Femoral Nail Placement

S Gouri, G Archana, K Vaibhav, J Himanshi, T Seema.  
Department of Anatomy, Darbhanga Medical College, Laheriasarai, Bihar, India.

**Introduction:** Intramedullary femoral nail placement is a widely accepted surgical technique for the treatment of femoral fractures. The success of this procedure greatly depends on the precise placement of the nail within the femur. The trochanteric fossa, is a crucial anatomical landmark, serves as a common entry point for the intramedullary nail.

**Aim:** To provide orthopedic surgeons the detailed insights of the variability of this anatomical region among individuals and aiding them in making informed decisions during femoral nail placement procedure.

**Materials and Methods:** Through the utilization of various radiological imaging modalities such as X-rays, Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and intraoperative C- ARM, this study comprehensively assesses the morphology and dimensions of trochanteric fossa. The authors have

studied the anatomy of Trochanteric fossa on 100 dry femur bone including both sides and sexes. The relationship of Trochanteric fossa with medullary canal was taken with the help of C- ARM.

**Result:** Key findings from this radiological evaluation include the measurement of the trochanteric fossa's dimensions, the assessment of its orientation in relation to the femoral shaft and the identification of any potential anatomical variations.

**Conclusion:** This study underscores the importance of radiological evaluation in planning intramedullary femoral nail placements. By enhancing our understanding of the trochanteric fossa's anatomy, we can contribute to safer and more effective surgical procedures and ultimately benefits the patients recovering from femoral fractures.

**Keywords:** Anatomical landmark, Femoral fractures, Imaging techniques.



# To Assess the Knowledge, Attitude and Perspectives of Teaching Faculty Members Concerning the Newly Implemented MBBS Curriculum: A Questionnaire-based Study

Abstract-29

**C Shivaleela, Professor of Anatomy, Sri Siddhartha Medical College, Tumkur, Karnataka, India.**  
**Vaibhav Anjankar, Professor of Anatomy, Jawaharlal Nehru Medical College, DMIHER, Sawangi Wardha, Maharashtra, India.**  
**Tripti Shrivastava, Professor of Physiology, Jawaharlal Nehru Medical College, DMIHER, Sawangi Wardha, Maharashtra, India.**  
**P Ramesh, Associate Professor of Anatomy, St. Peter's Medical College, Hosur, Tamil Nadu, India.**  
**GV Kumar, Professor and Head of Paediatrics, Sri Siddhartha Medical College, Tumkur, Karnataka, India.**

**Introduction:** Medical education in India is experiencing a shift from traditional curriculum to Competency-Based Medical Education (CBME). The core feature of CBME is to produce a competent Indian Medical Graduate through skill-based training and to equip them with metacognition.

**Aim:** To assess the knowledge, attitude and perspectives of teaching faculty members concerning the newly implemented MBBS curriculum.

**Materials and Methods:** The study was conducted in Sri Siddhartha medical college Tumkur, Karnataka, India. It is a Sequential Mixed method study conducted to assess the knowledge, attitude and perspectives of teaching faculty members concerning the newly implemented MBBS curriculum. The observations noted were the anticipated barriers for the implementation of this curriculum and areas of strengths, weaknesses in newer teaching methodologies.

**Results:** A total of 61 faculty members participated in the study from various departments of our medical college. 90.2% of the faculties were aware of the expected competencies of an Indian medical graduate and 85.2% are aware of their role as faculty in CBME curriculum. About 55.7% of the faculties are completely prepared for the implementation of the CBME Curriculum and about 9.8% of the faculties were not prepared for the implementation of the CBME Curriculum.

**Conclusions:** Significant barriers do exist however in the form of manpower and resources which need to be addressed by political commitment and administrative spearheading. Alignment and integration of various departments are the unique concepts of CBME which brings about a multidisciplinary holistic approach to health care.

**Keywords:** Competency-based medical education, Knowledge, Attitude, Perspectives.

# Optic Strut Position and Carotico-clinoid Foramen with their Clinical Relevance: A Cross-sectional Observational Study

Abstract-30

**Shahin Salma Khatun, Department of Anatomy, MGM Medical College, Navi Mumbai, Maharashtra, India.**  
**Satabdi Sarkar, Department of Anatomy, AIIMS -Kalyani, Kalyani, West Bengal, India.**

**Introduction:** Optic Strut (OS) is very important structures that is closely related to optic nerve, ophthalmic artery, internal carotid artery, cavernous sinus and pituitary gland. Presence of Carotico-Clinoid Foramen (CCF) may compress the internal carotid artery. So, it is important for the neurosurgeons to assess their position and variations.

**Aim:** To observe the variations in the position of Optic Strut and the presence of Carotico-clinoid foramen (CCF) and its type.

**Materials and Methods:** A cross-sectional, observational study have been done on 75 adult human dry skulls. The position of optic strut was observed in relation to the pre-chiasmatic sulcus as

pre-sulcal, sulcal and post-sulcal. The presence of carotico-clinoid foramen was also noted. The data was tabulated and analysed.

**Result:** The most common position of optic strut was sulcal (52%) followed by post sulcal (32%) and pre-sulcal (16%). In 12% of cases the pre-sulcal position was bilateral, whereas sulcal and post-sulcal position was bilateral in 44% and 25.33% of cases. The carotico-clinoid foramen (CCF) was present in 56.67% of cases and the most common type was incomplete in 32.67% of cases followed by complete in 24% of cases. CCF was absent in 43.33% of cases.

**Conclusion:** The present study mainly depicts the variations in the position of optic strut and also focuses on the presence of carotico-

clinoid foramen. The optic strut is often removed during anterior clinoidectomy whereas carotico-clinoid foramen forms the potential site for compression of internal carotid artery. The knowledge of

these structures and its variation will be helpful for the surgeons to plan surgery around the parasellar region.

**Keywords:** Internal carotid artery, Ophthalmic artery, Optic nerve.

## Comparative Evaluation of Buccal Mucosa in Individuals with Parkinson Disease and Healthy Controls: A Cytomorphometric Analysis

Abstract-31

**Disha K Davis, Department of Anatomy, AECS Maruthi Dental College, Bangalore, Karnataka, India.**  
**R Hannah Sugirthabai Rajila, Head of Department of Anatomy, Chettinad Academy of Research Education, Chennai, Tamil Nadu, India.**

**Introduction:** Parkinson's disease is a chronic, progressive neurodegenerative disease characterized by both motor and non-motor features, this is the second most common neurological illness, affecting 5% of the population over the age of 60 years. It predominantly affects the substantia nigra's dopamine-producing ("dopaminergic") neurons. Oral exfoliative cytology may be a more appropriate adjunctive diagnostic tool in conditions like Parkinsons disease, where the invasive techniques lose viability.

**Aim:** To analyse the cytomorphometric changes in the exfoliated cells of the oral mucosa, as an adjunct to the diagnosis of Parkinson disease.

**Materials and Methods:** A total of 50 patients aged between 55 and above with parkinsons disease identified from the department of Neurology of Nimhans Hospital, Bangalore, India. Smears were taken from the buccal mucosa of 50 parkinsons patients (study group) and 50 healthy individuals (control group). All the smears were stained with rapid Papanicolaou stain (PAP). In the PAP smears, the Nuclear Area (NA), Cytoplasmic Area (CA), micro-nuclei

and Cytoplasmic-to-Nuclear Ratio (CNR) were evaluated. From each slide, microscopic pictures of 20 cells were captured onto a computer, using Image Progress. A total of 10 clearly defined cells with good staining and with no overlap were cytomorphometrically analyzed using image J software for CP and NP.

**Results:** The results of the present study depicted that micronuclei were observed to be more in study group and significant difference was in perimeters of cytoplasm and nucleus of study group and control group.

**Conclusion:** According to the findings linked to the clinical observations, Parkinson's disease may cause changes in the morphological and functional characteristics of oral epithelial cells. These changes can be identified through microscopic and cytomorphometric analysis using exfoliative cytology, and they can aid in the diagnosis of the illness.

**Keywords:** Cytomorphological analysis, Neuro-degenerative, Oral epithelium.

Abstract-32

## Anatomical Variation in Branching Pattern of Recurrent Laryngeal Nerve: A Cadaveric Study

**Pooja Dadwani, Ila Sutterwala, Vasant V Vaniya.**  
**Department of Anatomy, Baroda Medical College, Vadodara, Gujarat, India.**

**Introduction:** The pathway of the recurrent laryngeal nerve on right and left side is different. The branching of the nerve occurs anywhere from inferior cornu of crico-thyroid joint to within the larynx.

**Aim:** To give thorough knowledge of the variation in branching pattern of recurrent laryngeal nerve in neck region.

**Materials and Methods:** A total of 32 cadavers (64 sides) taken from the anatomy department. During cadaveric dissection, the method were used for data collection is lateral approach to identify the branching pattern of nerve and anatomical landmark related to nerve. Data obtained prospectively included the location of the nerve, number of branches and the distance in millimetres from the inferior border of the cricothyroid to the point of bifurcation.

**Results:** A total of 64 (right=32, left=32) RLN in 32 cadavers were studied. Thirty-six (56.25%) nerves bifurcated or trifurcated before entry into the larynx. Bifurcations were more common on right (75%) than on the left (28%) ( $p<0.05$ ). Trifurcations were seen in three nerves of Right side RLN. Bilaterally branched RLN were observed in 9 (28%) of 32 cadavers. The median distance from the crico-thyroid to the point of division was 16 mm on the right and 13 mm on the left.

**Conclusion:** In this study, finding indicate that anatomical variation of recurrent laryngeal nerve is very common and provide information in the branching pattern in relation to adjacent structure that may be helpful to determine the location and anatomical relationship of nerve.

**Keywords:** Crico-thyroid joint, Dissections, Larynx.

# Clinical and Cytogenetic Profile of Disorders of Sex Differentiation: An Analytical Study from a Tertiary Care Hospital in Puducherry

Abstract-33

**Naga Jyothi, Rema Devi**

**Department of Anatomy- Division of Human Genetics, Pondicherry Institute of Medical Sciences, Pondicherry, India.**

**Introduction:** Disorders of Sex Development (DSD) encompass a wide spectrum of overlapping phenotypes manifesting as either isolated forms of a syndrome or as an incomplete penetrant trait of complex conditions. Multiple genetic etiologies have been demonstrated. Phenotypic sex is the result of the differentiation of internal ducts with consequent development of external genitalia under the influence of hormones and other factors. Disruption of this process results in DSD. The birth of a child with ambiguous genitalia creates multiple medical, surgical, ethical, psychosocial and physical problems for the child and parents.

**Aim:** To determine the genotype and phenotype of the DSD among patients - refer to Division of Human Genetics in the past 2 years.

**Materials and Methods:** A total (n=85) referred to the Department of 'Division of Human Genetics' during the period January 2022 and November 2023 were studied. Preliminary clinical examination followed by radiological examination was carried out on all patients. Pedigree analysis for three consecutive generations was done to find out the presence of consanguinity. The prevalence of the genotypic abnormalities and underlying consanguinity among patients with DSD and the associations between consanguinity and genotypic

variations in these patients. The association between DSD and consanguinity was assessed using Chi-square test. Karyotyping was done on peripheral blood for all patients and genotype was determined. Fluorescence In-Situ Hybridization (FISH) was done on peripheral blood for selected patients and underlying cytogenetic anomaly was observed. The results were tabulated.

**Results:** Out of 85 patients, 72 (84.7%) patients had a genotype of XY and 13 (15.2%) patients had a genotype of XX. 40% of consanguinity was identified in patients. Rest of the chromosomal anomalies and association between consanguinity and DSD will be discussed.

**Conclusion:** The global impact of DSD remains under recognized and an accurate diagnosis is essential as they are associated with co-morbidities and gonadal cancers. Next Generation Sequencing (NGS) based molecular diagnostics are the gold standard for genetic evaluation. A multi-disciplinary management approach comprising of pediatric endocrinology and urology is the recognized universal norm.

**Keywords:** Ambiguous genitalia, Developmental disorder, Fluorescence In-situ Hybridisation.

# Cheiloscopy- A Comparative Study among Cis Male, Cis Female with Trans Female

Abstract-34

**P Pagutharivu, Department of Anatomy St. John's Medical College, Bangalore, Karnataka, India.**

**Deepti Sashtri, Department of Anatomy, Vinayaka Missions Kripananda Variyar Medical College, Salem, Tamil Nadu, India.**

**Introduction:** Cheiloscopy is the study of lip prints and patterns. It was thought of as a method of identification of a person based on the characteristic arrangement of lines appearing on the red parts of the lips. Tsuchihashi, named the wrinkles and grooves visible on the lips as 'Sulci Labiorum Rubrorum' and the resulting pattern as 'Figura Linia Labiorum Rubrorum'. The lip prints are unique and do not change during the entire life of a person. The lip prints of parent and children and those of siblings have shown some similarities.

**Aim:** To study about the morphological pattern and classification of lip prints among the male, female and transgender and their predominance.

**Materials and Methods:** The study needs a scotch tape 14 mm wide and 50 mm long for taking prints by dabbing against the lips which is applied with bright colored lipstick from the individuals and a bond paper of A4 size to facilitate analysis. Then the tape will be

stuck to the bond paper with the details. The obtained lip prints were classified according to the Suzuki's classification and which type is more predominant in male, female and transgender was also noted.

**Results:** The Type I and sub type I were commonly observed in the upper anterior region i.e. in first and second quadrant which were distinctly identified [60%]. Type II was observed commonly in the second quadrant occurred sparingly [5%]. Type IV was not observed at all.

**Conclusion:** As per observations noted in the present study, the Indian subcontinent displays a variety of studies undertaken by the cheiloscopy experts. Hence researchers could differentiate the male and female due to their characteristic lip pattern.

**Keywords:** Lip prints, Sulci Labiorum Rubrorum, Suzuki's classification.

# Comparative Study on Occurrence of Co-habitation in Adult Female Wistar Rats: An Experimental Study

**K Yugesh, Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Sriher (Du), Porur, Chennai, Tamil Nadu, India.**

**S Senthil Kumar, Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Sriher (Du), Porur, Chennai, Tamil Nadu, India.**

**Introduction:** High skills are essential in assessment of co-habitation confirmation in experimental animals. Since rats are spontaneous ovulators, these varieties are commonly used in animal studies.

**Aim:** To compare the occurrence of co-habitation in adult female Wistar rats using various methods.

**Materials and Methods:** This experimental study was conducted in the Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Sriher (Du), Porur, Chennai, India, during December 2019. The study constituted of 72 (36 males and 36 females) Wistar rats. To identify the event of co-habitation, the rats were subjected to the following confirmatory tests: Naked eye examination method, non invasive vaginal lavage method and abdominal palpatory technique was done. Data were subjected to statistical analysis using Statistical Package for the Social Sciences (SPSS) software. Comparison of all three methods was done using non parametric tests.

**Results:** The non invasive vaginal lavage method was found to be more accurate (72.22%), compared to the visual method (16.66%) and the abdominal palpatory method (11.11%). A significant difference was seen, when comparing the three methods using Post-hoc Wilcoxon's signed-rank test. The p-value  $\leq 0.05$  was considered significant.

**Conclusion:** Based on the present experimental study, the findings concluded that the non invasive vaginal lavage method was more specific and easy to confirm that co-habitation had took place in adult female Wistar rats. In addition, the same method was found to be a simple, easy, and accurate method for estimating pregnancy in mating/generation studies.

**Keywords:** Abdominal palpatory method, Mating, Seminal plug, Spontaneous ovulators.

# Anthropometric Measurements of Human Right External Ear: A Cross-sectional Analytical Study

**Bhavana Shrivastava, PhD Scholar, Department of Anatomy, Pacific Institute of Medical Sciences, Umarda, Udaipur, Rajasthan, India.**

**Bhupesh Medatwal, Tutor, Department of Biochemistry, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India.**

**Introduction:** Anthropometry refers to the measurements of living human body dimensions for the purpose of understanding human physical variation. The shape, size and orientation of each external ear is unique as fingerprint. There is always need for anthropometric data for a given population, especially for the need of identification as well as designing products suitable for utility by the population.

**Aim:** To determine the normal anthropometric measurements (ear height and ear width) of external ear in male and female students and their comparison in either sex.

**Materials and Methods:** This cross-sectional analytical study was carried out on 50 medical students (25 males and 25 females) in the Department of Anatomy, Pacific Institute of Medical Sciences (PIMS), Umarda, Udaipur, Rajasthan, India, with no evidence of

congenital ear anomalies or previous ear surgeries. The duration of the study was 2 years and 6 months. Vernier Calliper were used to measure the ear height and width of external ear. Both parameters in males and females were compared by independent t-test.

**Results:** The mean values for right ear height and ear width in female subjects were found to be  $59.1 \pm 2.76$  and  $30.1 \pm 1.75$  mm, respectively. However, in male subjects, both values were  $61.9 \pm 3.15$  and  $32.1 \pm 2.69$  mm, respectively. Ear height and ear width were significantly larger in males than females with  $p=0.002$  and  $p=0.003$ , respectively.

**Conclusion:** The findings of the present study concluded that the normal anthropometric measurements (ear height and ear width) were significantly higher in males than in females.



# A Morphometric Study of Inferior Articular Facet of Atlas Vertebra and its Significance

Abstract-37

**Fatima Begum, PhD Scholar, Department of Anatomy, Shri Guru Ram Rai Institute of Medical and Health Sciences, SGRRU, Dehradun, Uttarakhand, India.**  
**Sadakat Ali, Professor and Head, Department of Anatomy, Shri Guru Ram Rai Institute of Medical and Health Sciences, SGRRU, Dehradun, Uttarakhand, India.**

**Introduction:** Atlas vertebra helps in complex biomechanical movements of the skull along with weight transmission of skull to spine. Vital centers of the medulla oblongata can get compressed by a dislocation or instability of the atlantoaxial joint. Recent developments in fixation technologies and minimally invasive surgical approaches have encouraged to knowing of various dimensions of atlas vertebrae which is very important for the development of instrumentation related to atlas vertebrae.

**Aim:** To determine mean values of the following parameters bilaterally-length of inferior articular facet (maximum Anteroposterior (AP) diameter), width of inferior articular facet (maximum transverse diameter).

**Materials and Methods:** This morphometric study was conducted in the Department of Anatomy, Shri Guru Ram Rai Institute of Medical and Health Sciences, SGRRU, Dehradun, Uttarakhand, India, in the period from 2020 to 2023, and included a total 120

dry, adult human atlas vertebrae of unknown age and gender which were examined for width and length of inferior articular facet on each side, in various medical colleges of North India. All dimensions were measured in bilateral manner using Digital Vernier Calliper.

**Results:** The mean length or AP dimension of the inferior articular facet on right and left side were  $18.39 \pm 2.83$  and  $17.91 \pm 2.19$  mm, respectively, the width or transverse dimension of the inferior articular facet on right and left side were  $15.12 \pm 1.36$  and  $15.04 \pm 1.41$  mm, respectively.

**Conclusion:** The observations of present study helps in improving understanding of bony dimensions of inferior articular facet of atlas vertebra which could facilitate diagnosis and preoperative planning of atlantoaxial joint dysfunction.

**Keywords:** Atlantoaxial joint, Dislocation, Medulla oblongata, Morphometry.

# Anthropometric Comparison of Nasal Parameters in Male and Female Students: A Cross-sectional Study

Abstract-38

**Sunita Acharya**  
**Department of Anatomy, Pacific Institute of Medical Sciences, Umarda, Udaipur, Rajasthan, India.**

**Introduction:** Nasal anthropometry is a study that deals with the measurements of the proportion, size and shape of nose. The variability in size and shape of human nose is huge and is influenced by factors like age, sex, environment, ethnicity and region. The knowledge about the dimensions of the nose viz length and width is important for the reconstructive, aesthetic surgeries and personal identification for forensic purpose.

**Aim:** To measure and compare nasal height and nasal width with respect to gender.

**Materials and Methods:** This cross-sectional study was conducted on 50 healthy volunteers (25 males and 25 females) aged between 17-25 years, in the Department of Anatomy, Pacific Institute of Medical Sciences, Umarda, Udaipur, Rajasthan, India. The data was collected from September 2021 to August 2023. Nasal height and nasal width

were measure using digital Vernier Calliper. The test of significance was done using independent t-test.

**Result:** The study showed the mean height and width of nose in males  $48.05 \pm 3.35$  mm and  $35.01 \pm 2.21$  mm, respectively and for females were  $46.18 \pm 3.83$  mm and  $32.36 \pm 2.97$  mm, respectively. There was no statistically significant difference found in nasal height of males and females ( $p$ -value=0.0730). Whereas, there was statistically significant difference found in nasal width of males and females ( $p$ -value=0.0008).

**Conclusion:** The findings of the present study concluded that there was no significant difference in nasal height of males and females, whereas nasal width showed significant difference in males and females.

# Elongated Styloid Process and its Clinical Implications

**GY Bhavya, C Divya**  
Yenepoya Medical College, Mangaluru, Karnataka, India.

**Introduction:** Eagle's syndrome is caused by an elongated styloid process or calcified styloid ligament. The styloid process which is part of temporal bone normally is about 20-30 mm, when it is <20 mm in length, it is called short and >30 mm is denoted as elongated styloid process. It causes recurrent throat pain, dysphagia, otalgia, foreign body sensation, headache, pain in the neck during rotation of the head.

**Aim:** To study elongated styloid process and its clinical implications.

**Materials and Methods:** The study has been conducted in 30 dry skulls at the Department of Anatomy, Yenepoya Medical College, Mangaluru, Karnataka, India. All skulls were regular in shape without deformities. It was observed that, styloid process was elongated bilaterally in some skulls and unilaterally, in some skulls. These skulls were studied for any other variations. The length of the styloid process was measured and noted. Photographs of the elongated styloid process was taken.

**Results:** Among the 30 skulls, styloid process was elongated unilaterally in four skulls and bilaterally in three skulls. Unilateral enlargement measurements were 7.1 cm, 4.5 cm, 5.4 cm, respectively. Bilateral enlargement measurements on right side were 6.7 cm, 4.6 cm, 5.4 cm, respectively and left side were 6.5 cm, 4.8 cm and 5 cm, respectively.

**Conclusion:** Undiagnosed and persistent pain in the neck, face and ear could be due to elongated styloid process or Eagle's syndrome. The diagnosis of Eagle's syndrome can be made by palpating the calcified styloid process in the tonsillar fossa. Imaging techniques like computed tomographic imaging confirmed the diagnosis. This knowledge might be helpful for the physicians and surgeons for the diagnosis of persistent intermittent pain in the facial and neck region.

# Anatomical Variations and Incidence of Mental Foramen and Accessory Mental Foramen in Dry Mandibles: A Descriptive Cross-sectional Study

**Dr. Anil Kumar Daswani, First Year Postgraduate Student, Department of Anatomy, Government Medical College, Kota, Rajasthan, India.**  
**Dr. Sumit Gupta, Professor, Department of Anatomy, Government Medical College, Kota, Rajasthan, India.**

**Introduction:** The Mental Foramen (MF) is a "bilateral opening" in the vestibular part of mandible through which nerve-endings like the inferior alveolar nerve or mental nerve and different corresponding veins or arteries emerge. Generally, this foramen is situated in the gap between premolars. In this context, it is seen that this also ramifies veins, arteries or nerves. Accessory Mental Foramen (AMF) is seen to be less than 1.0 mm in terms of size whereas this can vary posing a moderating effect and risks in terms of surgical complications in the regions.

**Aim:** To study anatomical variations and provide anatomical information about the position and incidence of accessory mental foramen as this.

**Results:** It was found that anatomical relation of MF as well as AMF with molars and premolars varies. The MF was present in all the mandibles and bilaterally seen. But the AMF was present only in six mandibles and unilateral in position.

**Conclusion:** The knowledge on presence of AMF is helpful to the dental surgeons to achieve full anaesthesia after nerve block when carrying out any surgery in this region. It can also, carry a high beneficial degree in terms of avoiding damage of nerves and vessels when carrying out endodontic or periodontal surgery in the region of canine root of the first molar tooth of mandible.

# Comparative Anatomy of Selected Bones of Forelimb and Hind Limb of Human and Canine

Abstract-41

**Shana, Meera Jacob**  
Yenepoya Medical College, Mangalore.

**Introduction:** Comparative anatomy is an important scientific discipline that studies the structure of animals in order to understand their evolutionary relationships and adaptation to their natural environment. It also involves the comparison of anatomy between different species, including humans. In the fields of orthopaedic and trauma research, animals are used frequently to model human pathologic conditions. The most important criteria for the choice of the appropriate animal model are anatomic and physiologic comparability. These fundamentals contribute to the validity of a model, whereas missing or incomplete knowledge may lead to results that cannot be extrapolated to the human condition. The comparability of the biomechanical joint function of quadrupedal laboratory animals with that of upright-ambulating humans is questionable.

**Aim:** To study the related changes of selected bones of human and canine (humerus, femur, skull and vertebrae).

**Materials and Methods:** The human and canine humerus, femur, skull and vertebrae were collected from the Department of Anatomy,

Yenepoya Medical College, Mangaluru, Karnataka, India. The macroscopical and microscopical features of the bone were studied. The morphometric data were recorded using a thread, tape rule in centimeters and electric weighing balance calibrated in gram. The measurement included elevation, depression, curvatures, borders and surfaces present on the bones to understand the various developmental changes in dogs with the respect to age. The bones were weighed on electric weighing balance and recorded, the total length across the longest part were also measured and recorded.

**Results:** Differences in the collected bones between humans and dogs were studied and the significant results obtained were presented.

**Conclusion:** The macroscopic and microscopic differences of the bones must be considered together with species-specific differences in the overall structure of the human bones. Any of these differences could mitigate the utility of the model and the validity of subsequent comparison.

# An Anomalous Origin of the Accessory Splenic Artery and its Significance in Surgical and Radiological Contexts: A Case Report

Abstract-42

**Jwaalyn Shifani Morgan, V Deshmukh, BR Sontakke, Shital Maske, AM Tarnekar**  
Department of Anatomy, All India Institute of Medical Sciences (AIIMS), Nagpur, Maharashtra, India.

Arterial supply of the spleen is by the splenic artery. The splenic artery is one of the largest branches of the celiac trunk. It passes through the lienorenal ligament and, before reaching the hilum of the spleen, usually gets divided into superior and inferior polar branches. Any additional artery supplying the spleen apart from a splenic artery is termed an accessory splenic artery. Although the incidence of accessory splenic artery <1.3%, lack of knowledge of this type of variation may lead to an increase in the duration of surgery and more blood loss. Therefore, in the present case report, authors present a peculiar pattern for the formation, origin and course of accessory splenic artery in an approximately 57-year-old formalin-

embalmed female cadaver in the study Institute. The authors encountered a principal splenic artery and an anomalous origin of accessory splenic artery from trunk of main splenic artery at the level of vertebra T12. This may add to the literature and alert surgeons and radiologists to be aware of reducing the sequelae of events in their patients. Awareness of the accessory splenic artery is cardinal to minimise intraoperative as well as postoperative complications for visceral surgeons in cases of upper gastrointestinal bleeding, partial splenectomy, and in splenic injury, arterial embolisation procedures and also to prevent profuse bleeding and decrease the postoperative morbidity for the patients.

# Rectus Para-sternalis- A Case Report on a Rare Anatomical Variant of Anterior Thoracic Wall Musculature

Abstract-43

Kummarikunta Vanajakshi, Ranjeeta Hansdak, Anjoo Yadav, Shilpi Garg  
Department of Anatomy, Lady Hardinge Medical College, New Delhi, India.

Rectus Para-sternalis is a rare muscular variant of anterior thoracic wall with an uncertain teleology. The presence of such muscle may cause alterations in Electrocardiogram (ECG). It can be misdiagnosed as an anterior chest wall tumor and may cause diagnostic dilemma during routine mammography screening.

The Cardiothoracic Surgeons may find difficulty in thoracic access and an anaesthesiologist may be misguided during ultrasound-guided thoracic wall blocks. On the other hand, it can be used as a muscular flap in head and neck surgeries and reconstructive surgeries of the breast. Hereby, the authors report a case of right-

sided long flattened strap-like muscle encountered during routine dissection in a 65-year-old male cadaver. The variant muscle stretched between tendinous origin of sternocleidomastoid and aponeurotic origin of external oblique muscle. It was positioned in the plane between pectoralis major and pectoral fascia. Therefore, foreknowledge about its occurrence is important for clinicians, surgeons, radiologists and anaesthesiologists, to avoid confusion and complications during interventional and diagnostic procedures related to this region.

# Morphometric Study on Bicipital Groove in Population of Bihar, India: A Cross-sectional Study

Abstract-44

Anuj Kumar, Postgraduate Student, Department of Anatomy, Anugrah Narayan Magadh Medical College, Gaya, Bihar, India.

**Introduction:** Bicipital groove is an important anatomical landmark present on the anterior aspect of the upper end of the humerus. It lies between the lesser tubercle medially and greater tubercle laterally. Intertubercular sulcus is continued distally for about 5 cm on the shaft of the humerus and altogether considered as bicipital groove.

**Aim:** To observe the detailed morphometric features of the bicipital groove in dry humeri of the population of Bihar, India and also to correlate its clinical implications through literature review.

**Materials and Methods:** This cross-sectional study was conducted between April 2023 to August 2023 (six months) in 100 adult human humeri (50 right and 50 left), available in the Department of Anatomy, and Forensic Medicine of the Anugrah Narayan Magadh Medical

College, Gaya, Bihar, India. With the help of measuring tape and a digital Vernier Calliper, length of the bicipital groove, width of the bicipital groove, depth of the bicipital groove, length of the medial wall of the bicipital groove, and length of the lateral wall of the bicipital groove were measured.

**Results:** Width of the bicipital groove, depth of the bicipital groove, length of the medial wall of the bicipital groove, and length of the lateral wall of the bicipital groove had the p-value of 0.264, 0.225, 0.278, 0.398 and 0.440, respectively.

**Conclusion:** The present study was an attempt to determine the morphometry of the bicipital groove in the humeri of the north Indian population.



# Morphometric Variations of Linea Aspera and Nutrient Foramina in Dried Human Femur Bones: A Descriptive Study

Abstract-45

Usha Guwalani, Aarushi Jain, Pratima Jaiswal, Harrish Thomas, Mayanka Saxena  
Department of Anatomy, Government Medical College, Kota, Rajasthan, India.

**Introduction:** Anatomical variation of linea aspera and location of nutrient foramina of femur is of vital importance to identify pathological forms from normal anatomical variations.

**Aim:** To analyse the variations of linea aspera along with the nutrient foramen of femur.

**Materials and Methods:** This descriptive study was conducted in Department of Anatomy, Government Medical College, Kota, Rajasthan, India, between October 2023 and November 2023, using conventional measuring techniques in 60 dry adult human femur bones available in the department. Parameters were measured using osteometric board and Vernier Caliper, documented and statistically analysed in Microsoft excel software.

**Results:** Average maximum length of linea aspera in right femur was 13.24 cm and average minimum length was 12.2 cm. Average

maximum length of linea aspera in left femur was 14.4 cm and average minimum length was 12.3 cm. Linea aspera was widest at its lower 1/3<sup>rd</sup> (right 4.21 mm; left 4.76 mm) and narrowest at its middle 1/3<sup>rd</sup> (right 2.7 mm; left 3.23 mm) in both sides. Most common pattern of linea aspera was the one with three ridges. Lateral ridges were prominent in most bones. Largest nutrient foramina were located at the level of proximal 1/3<sup>rd</sup> of linea aspera in 36 bones, middle 1/3<sup>rd</sup> in 10 bones, lower 1/3<sup>rd</sup> in 14 bones. All were single and directed towards upper end. Two bones had two foramina located at either ends of linea aspera.

**Conclusion:** The above determinants can help to identify location of nutrient foramina and linea aspera patterns to distinguish pathological variations that may be useful for radiologists and orthopaedicians.

# Morphometric Parameters of Fibula and Talar Facet: A Descriptive Study

Abstract-46

M Mittal, A Jain, P Jaiswal, S Gupta, H Thomas  
Department of Anatomy, Government Medical College, Kota, Rajasthan, India.

**Introduction:** Fibula is the slender lateral bone of the leg with vast clinical applications. The osteometric parameters from both ends and intervening shaft can be used to assess the body stature, nutritional status, and aid in evaluation and surgical management of different ankle pathologies, and bone grafting.

**Aim:** To evaluate osteometric parameters of fibula and Talar facet.

**Materials and Methods:** This descriptive study was conducted in Department of Anatomy, Government Medical College, Kota, Rajasthan, India. Convenient sampling consisting 50 dry, complete adult human fibulae was done. Measurement of three osteometric variables of fibula and Talar facet was done using digital Vernier Calliper and measuring tape, photographed and data were processed statistically using Microsoft Excel version 2019. The

variables measured were are maximum length, circumference of the neck, circumference at mid shaft, anteromedial length of Talar facet, posteromedial length of Talar facet and length of base of Talar facet. Results were statistically analysed and tabulated.

**Results:** The maximum length was 35.64 cm. The circumference of neck was 3.28 cm. The circumference at mid shaft was 3.82 cm. For the Talar facet, the anteromedial length was 18.54 cm. The posteromedial length was 19.68 cm. The length of base was 17.72 cm.

**Conclusion:** The evaluated parameters can be used to aid in evaluation and surgical management of ankle pathologies and designing of prosthetics.

# Morphometric Study of Scapula and Glenoid Cavity with its Relevance to Clinical Applications

Abstract-47

Asim Akhtar, Aarushi Jain, Pratima Jaiswal, Mayanka Saxena  
Department of Anatomy, Government Medical College, Kota, Rajasthan, India.

**Introduction:** Morphometric dimensions of scapula and glenoid cavity have shown substantial importance in Forensic Medicine and in Orthopaedics. Determining the identity of sex correctly of skeletal remains is critical in Forensic Medicine and importance of dimensions of glenoid cavity is necessary in various pathologies occurring in shoulder joint and also to design prostheses for shoulder arthroplasty.

**Aim:** To measure morphometric dimensions of scapula and glenoid cavity.

**Materials and Methods:** This morphometric study was done on dry human Scapula in the Department of Anatomy, Government Medical College, Kota, Rajasthan, India. Sixty scapulae (right-30 and left- 30) of unknown, age and sex were used in the study. All damaged scapula were removed from the study. Morphometric measurements maximum scapula length (msl), maximum scapula breadth (msb), superior-inferior glenoid diameter (si), anterior-posterior

diameter (ap), were taken using Vernier Calliper. Shape of glenoid cavity were studied by tracing its margins and obtaining its shape. Analysis was done in Statistical Package for the Social Sciences (SPSS), version 21.0.

**Results:** The mean length of right and left scapula was  $11.90 \pm 0.96$  cm and  $11.98 \pm 0.97$  cm, respectively. The mean breadth of right and left scapula was  $8.81 \pm 0.66$  cm and  $8.73 \pm 0.73$  cm, respectively. The glenoid cavity index of right and left scapula were  $68.21 \pm 88$  mm and  $70.33 \pm 89$  mm, respectively. Inverted comma shaped glenoid cavity present on right and left scapula were 40% and 43%, respectively.

**Conclusion:** The measurements observed in the present study were of less values and shape of the glenoid cavity on both side of scapula were predominantly of inverted comma-shaped. This fact may be taken into consideration in designing prostheses in north-western population.

# Ossification of Multiple Ligaments of Pelvis: A Case Report

Abstract-48

SR Suraksha, Shivarama Bhat  
Department of Anatomy, Yenepoya Medical College, Mangaluru, Karnataka, India.

Heterotopic ossification is a medical condition where bone formation occurs in unexpected and abnormal areas of the body. Hereby, the authors present the ossification of various structures in hip bones and joints of bony pelvis like sacrotuberous, sacrospinous and sacroiliac ligaments. A single bony pelvis was collected from Anatomy Department of Yenepoya Medical College and was observed for having heterotopic ossification. Observations regarding ossified muscles and ligaments of pelvic bones with measurements were recorded and photographs were taken. The observation revealed that bony pelvis with complete ossification of the erector spinae aponeurosis on the sacral dorsal surface, along with sacrotuberous

and sacrospinous ligament ossification on both right and left side. There was ossification of sacroiliac joint on left side. It can be concluded that, Orthopaedicians, Surgeons and Radiologists can benefit from understanding abnormal hip and pelvic ossifications, aiding in diagnosis and treatment planning. The sacrotuberous ligament is situated near critical structures such as the pudendal nerve and internal pudendal artery may lead to neurovascular compression syndromes when ossified. Understanding anatomy aids in developing treatments for this common clinical issue.

**Keywords:** Heterotopic ossification, Pudendal nerve compression, Sacroiliac joint ossification, Sacrotuberous ligament.

# Osteometric Variations in the Extensor Groove of Radial Styloid Process: A Descriptive Study

Abstract-49

Rashmi Meghwal, Aarushi Jain, Pratima Jaiswal, Harrish Thomas, Mayanka Saxena  
Department of Anatomy, Government Medical College, Kota, Rajasthan, India.

**Introduction:** In this era of electronics, usage of hand-held electronic devices has increased the overuse of thumb coupled with awkward positioning of wrist which led in increase of De Quervains tenosynovitis of the first extensor compartment, causing mobility disorders affecting quality of life. Surgical treatment along with Cortisone injections as treatment modality requires profound anatomical knowledge.

**Aim:** To determine osteometric data of first extensor groove on the radial styloid process.

**Materials and Methods:** This descriptive study was conducted in Department of Anatomy, Government Medical College, Kota, Rajasthan, India, in 80 dry human radii, from October 2023 to November 2023. Osteometric variables were measured using digital Vernier Calliper and Bony ridges on the groove along the lateral aspect of radial styloid process examined. The bones were divided

into three types based on the grooves. Type 1: Bone with groove divided into two sub grooves by a tiny bony ridge; Type 2: Bone with groove without any tiny ridge; Type 3: Bone without any groove.

**Results:** Among the total 80 dry human radii studied, Type 1 was found in 38% , Type 2 in 36% and Type 3 in 26% of the bones. The distance between the process of palmar bony ridge and process of dorsal bony ridge (AC) was 11.10+/- 1.61 mm on right side and 11.72+/-1.48 mm on left side. The distance between the process of palmar bony ridge and sharp point of styloid process of radius was 16.35+/- 2.20 mm on right side and 16.45+/- 2.18 mm on left side.

**Conclusion:** The above anatomical data provides a safe range for plating of radius fractures, treating De Quervain's tenosynovitis and for steroid injections depending on the bony landmarks which are easy to identify on the body surface.

# Morphological Analysis of Ligamentum Mucosum of knee Joint: A Descriptive Cadaveric Study

Abstract-50

D Nithya, Postgraduate, Department of Anatomy, JIPMER, Puducherry, India.  
Sulochana Sakthivel, Additional Professor, Department of Anatomy, JIPMER, Puducherry, India.

**Introduction:** Ligamentum Mucosum (LM) or the infrapatellar plica is a synovial fold which is extending from the infrapatellar pad of fat to the intercondylar notch of femur. Plica syndrome is painful knee impairment that occurs when the synovial plicae becomes thickened and fibrotic and oedematous.

**Aim:** To assess the macroscopic features of ligamentum mucosum of the knee joint and its variations in cadavers.

**Materials and Methods:** This descriptive cadaveric study was conducted in the Department of Anatomy, JIPMER, Puducherry, India, on 20 adult cadavers, from 2022 to 2023. Skin incision was made over superior border of patella. Patella was reflected downwards to expose intra-articular structures of knee joint. Ligamentum mucosum was identified by its attachment to intercondylar notch of femur and infrapatellar pad of fat. Morphometric parameters were measured using Vernier Calliper to the nearest millimetres.

**Results:** A total of 100% of the knees had a LM. Two types were detected. Cord-like Type 1 ligament was observed in 65.71% cases. This was the most common type and was characterised by a single longitudinal ligament. Type 2 ligament presented as a vertical septum. This septum divided the cavity into medial and lateral sides, and was observed in 34.29% of the cases. The mean length on the right side was 27.77±2.35 mm and left side was 28.55±2.34 mm.

**Conclusion:** Ligamentum mucosum, the infrapatellar plica, was initially thought to be incidental but recent studies have changed the view. It could be a potential cause for anterior knee pain, when no other pathology could be detected. Thus, the knowledge about the ligamentum mucosum is necessary in the evaluation of anterior knee pain.

**Keywords:** Infrapatellar plica, Plica syndrome, Synovial plica.

# A Cross-sectional Study of Morphological and Morphometric Parameters of Sacral Hiatus and its Importance in Caudal Epidural Block

Priyanka Jindal, Sangita Chauhan, Seema Gupta  
Department of Anatomy, SMS Medical College, Jaipur, Rajasthan, India.

**Introduction:** The opening at the caudal end of sacral canal is known as sacral hiatus. It is formed due to the failure of fusion of laminae of the fifth (occasionally 4<sup>th</sup>) sacral vertebra. The sacral hiatus transmits the fifth sacral nerve and coccygeal nerves. The Dural sac ends at the level of second sacral vertebra above the sacral hiatus. Therefore, it forms a convenient region for caudal epidural anesthesia of structures innervated by these nerves.

**Aim:** To evaluate the morphological and morphometric parameters of sacral hiatus in order to study the anatomical variations of sacral hiatus.

**Materials and Methods:** This cross-sectional study was conducted in the Department of Anatomy, SMS Medical College and attached group of Hospitals, Jaipur, Rajasthan, India on 50 adult dry human sacrum bones, from July 2022 to June 2023.

**Results:** Most commonly sacrum is made up of five vertebrae. Present study also documented similar composition in 46 (92%) sacra, whereas 2 (4%) cases were made up of four segments. The most common shape of sacral hiatus encountered in present study was Inverted-V (48%) followed by Inverted-U (32%) cases and in rest of the cases the shape of sacral hiatus was dumbbell shape (4%) and irregular (16%). Apex of sacral hiatus was mostly seen at 4<sup>th</sup> sacral vertebra in 74% of cases, at 3<sup>rd</sup> and 2<sup>nd</sup> sacral vertebra in 24% and 02% of cases, respectively.

**Conclusion:** The evaluation of morphological and morphometric parameters of sacral hiatus is important to study the anatomical variations of sacral hiatus, which can be useful for administering caudal epidural block and improve its reliability and success rate.

**Keywords:** Dural sac, Sacral nerve, Vertebra.

# Variations in the Tendons Forming Boundaries of Anatomical Snuff Box with Clinical Implications

Sabita Kumari, Rakhee Sharma, Sonia Beniwal, Renu Chauhan  
Department of Anatomy, University College of Medical Sciences, New Delhi, India.

**Introduction:** Anatomical snuff box is a triangular depression on the lateral aspect of dorsum of hand bounded laterally by Abductor Pollicis Longus (AbPL), Extensor Pollicis Brevis (EPB) and medially by Extensor Pollicis Longus (EPL) muscle. Variations in these tendons have been widely studied but mostly separately. In the present study, authors have studied all three tendons. Variations in these tendons have frequently been associated with De-Quervain tenosynovitis, 1<sup>st</sup> carpometacarpal arthritis and trapezio-metacarpal subluxation.

**Aim:** To study the variations (number and site of insertion) of the tendons forming boundaries of anatomical snuff box.

**Materials and Methods:** This study was conducted in the Department of Anatomy, University College of Medical Sciences, New Delhi, India, in which 23 formalin-fixed cadaveric upper limb were dissected and looked for variations with respect to number and site of insertion.

**Results:** The number of tendons of AbPL varied from 2 to 7 tendons, six being minimum (only one limb) and three and four being maximum (in seven limbs each). Multiple slips were common on right side (R:L=13:10). Out of all 90 tendinous slips, 48 (53%) were inserted on the base of 1<sup>st</sup> metacarpal and 42 (46%) were inserted on trapezium. EPB had only 1 or 2 tendons. One in 19 limbs and two in four limbs (R:L=3:1). EPL had two tendons in 11 cases (R:L=7:4) and single tendon in 12 cases.

**Conclusion:** Multiple tendinous slips of AbPL attach either on base of 1<sup>st</sup> metacarpal or trapezium. Knowledge of variation in attachment and number is crucial for Orthopaedic surgeons for diagnosis and treatment response to De-Quervain tenosynovitis, 1<sup>st</sup> carpometacarpal arthritis and trapezio-metacarpal subluxation.



# Presence of Suprascapular Foramen: A Case Report

Abstract-53

Jatin Vankar, Dipali Trivedi  
Anatomy Department, BJ Medical College, Ahmedabad, Gujarat, India.

The scapula is a large, triangular bone that lies over the posterolateral aspect of chest wall, covering parts of second to seventh rib, with a vertical long (craniocaudal) axis. The superior border of scapula is thin, sharp and shortest. At its anterolateral end, it is separated from the root of coracoid process by the suprascapular notch. The suprascapular notch is converted into a foramen by suprascapular ligament- Superior Transverse Scapular Ligament (STSL). The suprascapular foramen transmits the suprascapular nerve, whereas the suprascapular vessels pass above the ligament. During routine osteological study at the study Institute, it was observed that superior transverse scapular ligament ossified in scapula, thus

converting suprascapular notch into foramen. The suprascapular foramen measured about 1.4 cm, as its maximum vertical height and about 1 cm as its maximum transverse length. The ossified STSL measured 1.5×1 cm. No other deformities were noted in the bone. This type of anatomical variation is found in 5-10% of scapula. Compression of the suprascapular notch is common in volleyball players and baseball pitchers.

It can be concluded that, knowledge of anatomical variations of suprascapular notch is essential for clinicians for making a proper diagnosis of suprascapular nerve entrapment syndrome, and its confirmation is necessary by radiologists.

# Presence of Persistent Median Artery: An Anatomical Study on Cadaver

Abstract-54

S Karthiyayini, II Year Postgraduate, Department of Anatomy, Madurai Medical College, Madurai, Tamil Nadu, India.  
M Sobana, Associate Professor, Department of Anatomy, Madurai Medical College, Madurai, Tamil Nadu, India.

**Introduction:** The median artery is the branch of axis artery of the upper limb bud. The distal part of axis artery forms the anterior interosseous artery. From the anterior interosseous artery develops the median artery, which grows along the median nerve to communicate with the capillary plexus of axis artery. Meanwhile, the capillary plexus differentiates into superficial and deep palmar arch. Whereas the median artery communicates with superficial palmar arch. After the development of radial and ulnar artery, the median artery regresses from the palmar arch.

**Aim:** To present a persistent median artery of right forearm and to compare the data obtained from the literature.

**Materials and Methods:** This anatomical cadaveric study was conducted in the Department of Anatomy, Madurai Medical College, Madurai, Tamil Nadu, India, from June 2022 to November 2023. The persistent median artery of forearm was found during the routine dissection of a male cadaver.

**Results:** The persistent median artery was seen along with median nerve, contributing to the superficial palmar arch.

**Conclusion:** The persistent median artery which is rarely seen in adults, was found in a male cadaver. This can be clinically relevant to the surgeons, who treat hand disorders and injuries.

# A Study of Morphological Variations of the Suprascapular Notch in the North Indian Population

Abstract-55

**RK Sharma, Postgraduate, Department of Anatomy, University College of Medical Sciences, New Delhi, India.  
R Choudhary, Senior Resident, Department of Anatomy, University College of Medical Sciences, New Delhi, India.  
R Chauhan, Director Professor and Head, Department of Anatomy, University College of Medical Sciences, New Delhi, India.**

**Introduction:** The suprascapular notch is present at the lateral end of the upper border of the scapula, close to the root of the coracoid process. It forms a tunnel with the superior transverse scapular ligament. The suprascapular nerve and vein run under the superior transverse ligament.

**Materials and Methods:** The study was conducted on the suprascapular notches of 120 dry human scapulae obtained from the Department of Anatomy, University College of Medical Sciences, New Delhi, India.

**Results:** The morphological variations in the shapes of suprascapular notches were studied in 102 scapulae. Suprascapular notch was

U-shaped in 65 (54.16%) scapulae, V-shaped in 7 (5.83%), and J-shaped in 25 (20.83%). Eighteen (15%) scapulae were without any notch. In 5 (4.16%) scapulae, the transverse scapular ligament was completely ossified, and the notch was converted into a foramen.

**Conclusion:** Surgeons and Orthopaedicians must be aware of the variations in suprascapular notches, so as to avoid any inadvertent damage to suprascapular nerve and vessels, while dealing with any surgery in scapular region.

**Keywords:** Scapulae, Suprascapular nerve, Transverse scapular ligament.

# A Rare Combined Circumaortic and Retroaortic Left Renal Vein: A Case Report

Abstract-56

**RB Udit Narayan, Junior Resident, Department of Anatomy, JIPMER, Puducherry, India.  
Nithya Dhakshnamoorthy, Junior Resident, Department of Anatomy, JIPMER, Puducherry, India.  
T Jahira Banu, Senior Resident, Department of Anatomy, JIPMER, Puducherry, India.  
Sulochana Sakthivel, Additional Professor, Department of Anatomy, JIPMER, Puducherry, India.**

Variations of the left renal vein can be in the form of Circumaortic Left Renal Vein (CLRv) or renal collar, Retroaortic Left Renal Vein (RLRV), additional renal vein, or multiple primary tributaries. The renal veins drain at a right angle into the Inferior Vena Cava (IVC). These variations have been found to be associated with clinical conditions like varicocele and pelvic varices and pose a significant risk of iatrogenic haemorrhage during retroperitoneal surgeries. In the present report, authors describe the combined variation of CLRv and RLRV found during retroperitoneal dissection of female cadaver. Two renal veins originated from the renal hilum, anterior

and posterior to the renal artery. Anterior vein got divided into two limbs. One limb passed anterior to the aorta and drained into the IVC. Other limb joined with the posterior vein, passed posterior to the aorta and drained into IVC, thus forming CLRv. A tributary originated from the posterior vein and drained into IVC as RLRV. The prevalence of CLRv varies from 0.96% to 7.4% and RLRV from 0.5% to 5.9% in various studies. Thus, it can be concluded that, the knowledge of left renal vein variations is vital, as the left kidney is commonly used as a donor organ and in management of various clinical conditions.

# PHYSIOLOGY ABSTRACTS

## Prevalence of Diabetic Peripheral Neuropathy in Newly Diagnosed Patients of Type 2 Diabetes Mellitus at a Tertiary Care Hospital: An Observational Study

Abstract-57

**Jaspreet Kaur, Department of Physiology, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**Jayballabh Kumar, Department of Physiology, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**VK Singh, Department of Internal Medicine, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**Rajendra K Pandey, Consultant Neurologist, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**Prithpal S Matreja, Department of Pharmacology, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**Ritu Adhana, Department of Physiology, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.**

**Introduction:** The prevalence of Type 2 Diabetes Mellitus (T2DM) is growing worldwide, and these patients may be asymptomatic and present with complications at the time of diagnosis. Diabetic neuropathy is the most common complication affecting the patients who may present with distal polyneuropathy at the time of diagnosis and also poor glycaemic control. The diabetic peripheral polyneuropathy affects approximately one in every 10 newly diagnosed patients, whereas two third of patients with diabetes mellitus have clinical or subclinical neuropathy.

**Aim:** To find prevalence of diabetic peripheral neuropathy in newly diagnosed patients of T2DM at a tertiary care hospital.

**Materials and Methods:** This observational study was carried out in the Department of Physiology, Teerthankar Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India, from January 2017 to December 2018, on patients diagnosed with T2DM as per American Diabetes Association (ADA) criteria. A thorough clinical examination; Nerve Conduction Velocity (NCV) testing; evaluation of

plasma glucose and glycosylated haemoglobin and assessment of neuropathy by using the Diabetic Neuropathy Index (DNI) and Diabetic Neuropathy Score (DNS) was performed on all patients.

**Results:** About 18% of patients had signs of peripheral neuropathy as shown by NCV testing at the time of diagnosis. These patients had elevated levels of glycosylated haemoglobin, fasting plasma glucose and 2-hour plasma glucose and lower scores of DNI and DNS which were statistically significant. The most common type of neuropathy seen in these patients was sensorimotor involvement with demyelinating type of neuropathy with more involvement of lower limbs. The NCV studies showed reduced distal latency and prolonged amplitude as well as conduction velocity in patients with diabetic neuropathy.

**Conclusion:** The present study showed that approximately one in five newly diagnosed patients with type 2 diabetes mellitus are at risk of developing diabetic peripheral neuropathy.

## Lifestyle Habits and Mental Health Assessment in MBBS students

Abstract-58

**AJ Divya, Senior Resident, Department of Physiology, JSS Medical College, Mysuru, Karnataka, India.**

**Sheryl Agarwal, Senior Resident, Department of Physiology, JSS Medical College, Mysuru, Karnataka, India.**

**Introduction:** Medical students play a crucial role in shaping the health and well-being of the society. Adoption of unhealthy and poor habits can lead to various problems like obesity, diabetes type 2 cardiovascular disease and bone and joint problems. So it makes it essential that our future doctors are living and maintaining

a proper healthy lifestyle in all aspects of the environment such as social, mental and physical. Initiating a very healthy lifestyle, leads to healthy professional community.

**Aim:** To assess lifestyle habits and mental health among Bachelor of Medicine and Bachelor of Surgery (MBBS) students.

**Methods and Materials:** Articles related to students studying in various medical college of India were collected from the database like google scholar, Biomed Central, National Centre for Biotechnology Information (NCBI), Pubmed, Springer, Research Gate and systematic review was done on assessing the lifestyle

habits and mental health status. The data collected was aggregated, summarised and analysed using random effects meta-analysis.

**Result:** The data collected was aggregated, summarised and analysed using random effects meta-analysis.

## A Descriptive Study on Correlation between Exposure to Social Enrichment with Sleep and Cognition in Wistar Rats

Abstract-59

**Preethi Hegde, Vijay Kagal, T Rao Laxmi, Bindu M Kutty**  
**Department of Physiology, KS Hegde Medical Academy, Mangaluru, Karnataka, India.**  
**Department of Neurophysiology, NIMHANS, Bangaluru, Karnataka, India.**

**Introduction:** Sleep and cognition are strongly interlinked both being a complex biological process. Environmental conditions have its role in cognition. However, the specific component of the environment is not well understood in sleep. Thus, in the present study, authors explored the role of rearing environment, as a single component on sleep and cognition that may help to overcome this life threatening conditions in adulthood.

**Aim:** To correlate between the effects of rearing environment on sleep architecture, cognition and neuronal activity of the hippocampus during Rapid Eye Movement (REM) sleep.

**Materials and Methods:** This descriptive study was conducted in the Department of Neurophysiology, National Institute of Mental Health and Neurosciences (NIMHANS), Bangaluru, Karnataka,

India, between February 2021 to March 2014. Male adult Wistar rats reared in standard housing and social enrichment were implanted with electrodes for polysomnographic recording in the cortex, different hippocampal subregions, Electrooculography (EOG) and Electromyography (EMG). Further cognition was assessed with Morris water maze task for navigational and attentional ability.

**Results:** The REM sleep theta activity was increased in the hippocampal cornu Ammonis 3 (CA3) subregion associated with an increased memory retention in Morris water Maze task in rats reared in social enrichment.

**Conclusion:** The altered neuronal activity in the hippocampus and enhanced memory in socially enriched rats reveals the importance of rearing environment on cognition.

## A Cross-sectional Study on the Menopausal Symptoms of South Indian Working Women and its Correlation to Lifestyle and Anthropometric Parameters

Abstract-60

**Kalpna Balasubramaniam, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangaluru, Karnataka, India.**  
**Padmini Thalenjeri, Department of Physiology, AJ Institute of Medical Sciences and Research Centre, Kuntikana, Mangaluru, Karnataka, India.**  
**Grrishma Balakrishnan, Department of Physiology, Yenepoya Medical College, Deralakatte, Mangaluru, Karnataka, India.**

**Introduction:** Menopause is associated with various psychological symptoms, behavioral and physiological changes that affect the quality of life of women. Leading an active lifestyle lowers these symptoms during the transitional phase and will ensure a trouble-free menopause.

**Aim:** To find the total score of menopausal symptoms among the pre, peri and, postmenopausal women using the Menopausal Rating

Scale (MRS) and to correlate it with the working hours, lifestyle and anthropometric parameters.

**Materials and Methods:** A cross-sectional study was conducted in the Department of Physiology, Yenepoya Medical College, Deralakatte, Mangaluru, Karnataka, India, between May 2015 to July 2015. The study was done on 108 working women, who were classified according to the menopausal status into three

groups as pre, peri and post menopausal women. All participants were subjected to Menopausal Rating Scale (MRS) to assess their menopausal symptoms. Anthropometric parameters, working hours and lifestyle parameters of all the women were recorded using the standard procedures, validated questionnaire and were tabulated.

**Results:** Total score of the menopausal symptoms was more among the post menopausal women. A positive correlation was seen with Waist-hip Ratio and menopausal symptoms among perimenopausal women ( $r=0.28$ ). A significant negative correlation

was seen with exercise frequency and menopausal scores among postmenopausal women ( $r=-0.42$ ). A positive correlation was seen with working hours and psychological symptoms among peri and post-menopausal women ( $r=0.05$  and  $r=0.06$ ).

**Conclusion:** The present study concluded that the total score of the menopausal symptoms was more among the post menopausal women. Working hours and lifestyle parameters have a significant negative impact on the menopausal symptoms and in the transition phase of menopausal women.

## Stammering- A Non Interventional Observational Study

Abstract-61

**VB Suman, Associate Professor, Department of Physiology, Kasturba Medical College, Mangaluru, Manipal Academy of Higher Education (MAHE), Manipal, India.**

**Khalid Parwez, Assistant Professor, Department of Microbiology, Kasturba Medical College, Mangaluru, Manipal Academy of Higher Education (MAHE), Manipal, India.**

**Gangadhar, Medical Student, Shree Narayan Medical Institute and Hospital, Saharsa, Bihar, India.**

**Introduction:** Stammering occurs when the forward flow at speech is interrupted abnormally by the repetition of sound syllables, articulatory posture on avoidance and struggled reaction. Stuttering in mainly disorder of speech production and aspects of language fluency does not from a part of problem of stuttering. The overt feature of stammering in facial grimaces, repetition which can be single on multiple, lips blinking and prolongation, and covert featuring fear, as unpleasant situation the mare and blockage.

**Aim:** To understand linguistic aspect, auditory and brain function of stammering.

**Materials and Methods:** This non interventional observational study was conducted on a total of 100 patients (50 males and 50 females) from the hospital from West Bengal, Bihar, and Uttar Pradesh. The sampling technique included asking questions to the

patients related to features and stammering history of the patient. Testing using all pair-wise multiple comparison procedures. Clinical data was collected using hybrid approach of electronic as well as paper-based system.

**Results:** Among all the 100 patients with history of stammering, there were 95% males and had onset by birth. Most of them had stammering, while talking to strangers and they were not on any medication or therapy and also there was hesitation and prolongation of last words which majority people complained.

**Conclusions:** The present study findings can help to discover which age group is more affected with stammering and understanding the linguistic aspects of stammering. It can help to know greater about the overt functions of stammering and establish relation between stammering and singing.

## Cognitive Responses to Acute Cold-water Ingestion: An Interventional Study

Abstract-62

**SA Priya, Department of Physiology, JSS Medical College, JSSAHER, Mysuru, Karnataka, India.**

**Introduction:** Human body, chiefly made of water, shows significant changes in a dehydrated state. There is decline in cognitive performance in dehydrated states. So far, researchers have shown that cognitive ability can be modulated by hydration and there is a paucity of literature showing modulation of cognition after acutely ingesting cold water.

**Aim:** To assess cognition by Digit Symbol Substitution Test (DSST) and to compare cognition among the three groups: Cold water ingestion, room temperature water ingestion and with no water ingestion group.

**Materials and Methods:** This interventional study was conducted in the Department of Physiology, JSS Medical College, JSSAHER, Mysuru, Karnataka, India, between August 2022 to October 2022,

and comprised 228 college students of both genders randomly divided into three groups (Group 1 = Cold water ingestion group, Group 2 = Room temperature water ingestion group, Group 3 = No water ingestion group) with varying hydration status aged between 18-28 years and their cognition measures were assessed by DSST after acute water intake as grouped above. The results were analysed with Analysis of Variance (ANOVA) using Statistical Package for the Social Sciences (SPSS) software.

**Results:** The mean $\pm$ SD of DSST scores was 99.81 $\pm$ 0.67, 87.31 $\pm$ 10.24 and 62.67 $\pm$ 24.16 in acute cold water ingestion group, acute room temperature water ingestion group and no water ingestion group, respectively with p-value=0.001 among the groups.



**Conclusion:** The results of the present study showed that cognition to be improved by acute cold water ingestion, suggesting relationship between cognition and temperature regulation.

## The Influence of Handedness on Mental and Neuropsychological Performance in Young Adults: A Cross-sectional Study

Abstract-63

**S Smilee Johncy, Department of Physiology, conducted in JJM Medical College, Davangere, Karnataka, India.**  
**T Vivian Samuel, Department of Biochemistry, JJM Medical College, Davangere, Karnataka, India.**

**Introduction:** The dominance of one hand over the other is known as handedness. Handedness is influenced by various factors, including the environment a person is raised in, genetics, culture, and prenatal environment. Each cerebral hemisphere is responsible for different tasks that are not usually carried out by opposite hemisphere. Hence, handedness may have notable impact on neuropsychological capacities.

**Aim:** To find out there any differences in mental and neuropsychological performance in left-handed and right-handed individuals using standard tests of cognitive function.

**Materials and Methods:** This cross-sectional study was conducted in the Department of Physiology, conducted in JJM Medical College, Davangere, Karnataka, India between July 2020 to October 2020, on 30 right-handed and 30 left-handed males, under the age range of 18–25 years. Subjects were chosen by

simple sampling, by applying criteria for inclusion and exclusion. Standardised tests were used to assess the various aspects of mental and neuropsychological performance. The findings were compared using student's Unpaired t-test.

**Results:** The left-handed subjects took less time than the right-handed to finish the trail making test. The groups' scores on the Digit Span test did not differ from one another. No statistically significant variations were observed in the memory score on the Folstein mini-mental state examination. However, left-handed subjects had shorter memory score durations. Most of the right-handed had auditory as style of learning, while majority of the left-handed had visual as style of learning.

**Conclusion:** The present study showed that left-handed individuals showed high mental and neuropsychological performance than right-handed individuals.

## Project-based Learning for First Year MBBS Students: An Observational Study

Abstract-64

**R Divya, Professor, Department of Physiology, SRM Medical College, Hospital and Research Centre, Trichy, Tamil Nadu, India.**  
**Aparna Menon, Assistant Professor, Department of Physiology, Dhanalakshmi Srinivasan Medical College and Hospital, Perambalur, Tamil Nadu, India.**

**Introduction:** Project-based learning, which have been used in the undergraduate medical curriculum in phase 3 and during the internship process and has been shown to have promising results in improving student aptitude and knowledge. Similar techniques could be started from the first year to improve knowledge and aptitude of medical students.

**Aim:** To determine the effectiveness of project-based learning in improving subject knowledge among first year mbbs students.

**Materials and Methods:** An observational study was conducted in the Department of Physiology, Dhanalakshmi Srinivasan Medical College and Hospital, Perambalur, Tamil Nadu, India between March 2023 to July 2023. After obtaining ethical clearance, 35 students from first year Bachelor of Medicine and Bachelor of Surgery (MBBS) were recruited by voluntary interest for the study. The students were given a pretest containing 10 questions related

to muscle physiology and answers were recorded. Students were then split into 10 groups with 3-4 students in each group and were guided to perform 10 different projects in muscle physiology using equipment available at Clinical laboratory, Physiology Department. After completion of project, they were guided regarding analysis of their findings which they presented in front of their peers. Post assessment was done using same questions and feedback was collected from the participants.

**Results:** A total of five of the 34 students were males and 29 were females. Students showed an average improvement of 7.32 points out of 20, which was found to be significant between preproject and post-project assessment.

**Conclusion:** Project-based learning helped first year MBBS students to improve their subject knowledge significantly.

# Association between Haemoglobin Status and Blood Pressure Responses to Isometric Handgrip Test among Females: A Cross-sectional Study

Abstract-65

Ashwini, Department of Physiology, KS Hegde Medical Academy, Mangaluru, Karnataka, India.

**Introduction:** Anaemia is one of the major public health problems in India in females of all age groups and is responsible for about 1 million deaths a year, three-quarters of which occur in Africa and Southeast Asia. Most of the physiologic adjustments occurring in response to anaemia are cardiovascular in nature. Autonomic nervous system has a primary role in both long-term and transient cardiovascular adjustments. Altered sympathovagal balance attributed to anemic hypoxia may predict the risk of cardiovascular disease among anemic individuals.

**Aim:** To study the association between haemoglobin concentration and blood pressure responses to the isometric handgrip test among females.

**Materials and Methods:** This cross-sectional study was conducted in the Department of Physiology, KS Hegde Medical Academy, Mangaluru, Karnataka, India, involving 60 female volunteers between 19-25 years. Anthropometric measurements like height, weight, and Body Mass Index (BMI) were measured. Haemoglobin

levels were estimated using the cyanmethaemoglobin method. Volunteers were classified into two groups (n=30 each) based on World Health Organisation (WHO), haemoglobin concentrations to diagnose anaemia, and assessment of severity: Hb >12 g/dL, Hb <12 g/dL. The isometric handgrip test was performed using standard techniques, and blood pressure responses were measured.

**Results:** The maximum handgrip strength was significantly higher (p-value=0.04) among those with haemoglobin level more than 12 g/dL, compared to those with less than 12 g/dL. The difference in change in Blood Pressure (BP) (pre-release minus baseline), heart rate values among study groups was also statistically significant (p-value=0.02). Spearman's correlation statistics showed a significant positive correlation between haemoglobin levels and blood pressure responses to isometric handgrip exercise (p-value=0.03).

**Conclusion:** The present study showed that a mild alteration in haemoglobin status will affect blood pressure responses to isometric handgrip test among females.

# A Cross-sectional Study on Blood Group Distribution and its Correlation with Bleeding Time and Clotting Time among First year Undergraduate Medical Students

Abstract-66

Abirlal Sen, Senior Resident, Department of Physiology, Tripura Medical College and Dr. BRAM Teaching Hospital, Hapania, Agartala, Tripura (West), India.

Dibakar Dey, Professor and Head, Department of Physiology, Tripura Medical College and Dr. BRAM Teaching Hospital, Hapania, Agartala, Tripura (West), India.

**Introduction:** There is a clear association between ABO blood group status and levels of von Willebrand factor (vWF). Blood group O is related with lower expression of vWF which leads to relative bleeding tendency. Thus, relationships between Bleeding time (BT), Clotting time (CT) and blood groups are important in certain conditions like epistaxis, surgery, thrombosis etc.

**Aim:** To determine the blood group, of the students and to determine their relationship with BT and CT.

**Materials and Methods:** This Institution-based cross-sectional observational study done in Department of Physiology, Tripura Medical College and Dr. BRAM Teaching Hospital, Hapania, Agartala, Tripura (West), India for a period of one year. BT and CT were done by Duke's Method and Capillary glass tube method, respectively. Blood groups were determined on basis of presence or absence of agglutination. Qualitative data was expressed in percentage and

quantitative data in frequency, mean and standard deviations. Chi-square test was applied. The p-value of <0.05 was considered as statistically significant.

**Results:** Bleeding time more than 4 minutes was found maximum in group O (78.5%) compared to other blood groups (p=0.001 by Chi-square analysis). Clotting time >6 minutes was found to be maximum in blood group O (53.8%). Gender-wise distribution showed CT >6 minutes in 61.53% females, as compared to 56.06% males (p-value=0.5826).

**Conclusion:** In the present study, CT was >6 minutes and BT was >4 minutes maximum in number in blood group O. Gender-wise BT and CT were higher in females than males. In the present study, authors concluded that O blood group females are prone to certain diseases like epistaxis and thrombosis.

# Introducing Methodology of Artificial Intelligence into the System of Homoeopathic Case-taking: A Pilot Study

**N Shanthi, Professor, Department of Organon of Medicine, Vinayaka Mission's Homoeopathy Medical College and Hospital, Salem, Tamil Nadu, India.**

**Introduction:** Incorporating Artificial Intelligence (AI) into Homoeopathic case-taking could entail using AI to assist in the analysis of massive quantities of patient data, recommending viable remedies based on symptoms, or even assisting in individualised remedy selection. AI could assist practitioners in identifying patterns and connections in symptoms that are not immediately evident, potentially improving the accuracy and efficiency of homoeopathic therapies. In changing AI in homoeopathic case-taking, data analysis, symptom recognition, individualised treatment, efficiency and speed learning, and improvement may be made. Homoeopaths can match a patient's symptoms to the most similar remedy from the large array of homoeopathic medications by methodically compiling information about the patient's symptoms, history, lifestyle, and other peculiarities. Individual treatment is prioritised in homoeopathy depending on the totality of symptoms. Machine learning processes massive amounts of data, assisting in disease diagnosis, pattern recognition, and prediction. This contributes to more accurate diagnosis and better patient outcomes. Analyses patient data, genetic information, and numerous health markers to

create tailored treatment regimens in homoeopathy. Manual nature of case-taking storing, organising and retrieving vast amounts of patient data for reference and analysis can be challenging. These limitations could potentially impact the accuracy and efficiency of remedy selection and individualised treatment. By introducing artificial intelligence in homoeopathy can bring enhanced decision support in analysing vast amounts of patient data and suggesting remedies and offering insights into possible correlations that might escape human observation.

**Conclusion:** By meticulously collecting and organising patient data from various sources like electronic health records and Internet of things (IoT) devices. AI enables a deeper understanding of symptoms and remedies. This collaboration between AI's analytical capabilities and homoeopathic principles ensures more precise and tailored treatments. As AI continues to refine its understanding through machine learning, it stands poised to revolutionise homoeopathy, empowering practitioners with enhanced decision-making tools to individualise patient care.

# Evaluation and Comparison of Serum Alkaline Phosphatase in Diabetic Patients with Active Dental Caries

**PG Asha Kumara, Department of Physiology, GR Medical College, Hospital and Research Centre, Mangaluru, Karnataka, India.**

**Introduction:** Majority of the systemic diseases evidently present oral symptoms and Diabetes Mellitus (DM) is not an exception. Compared to healthy people, patients with DM are liable to have higher and more severe dental caries and periodontal disease. In addition, people with diabetes also have poor oral hygiene encompassing elevated rate of plaque, calculus, tooth decay, gingival swelling, and deep periodontal pockets. They are also more prone to infections, including dental abscesses that result from progressive dental caries. The dental caries affects the salivary proteome.

**Aim:** To evaluate and to compare the serum alkaline phosphatase concentration in type 2 diabetic patients with active dental caries.

**Materials and Methods:** The study subjects were selected from DAPM RV Dental College and Hospital, Bangalore, Karnataka, India, within the age group between 21 to 50 years. Subjects without any dental caries and without diabetes were taken as controls i.e. Group 1. Further the cases were categorised into three groups based on presence or absence of dental caries and type 2 diabetes mellitus into group 2, 3 and 4.

**Results:** Serum alkaline phosphatase levels were found to be more in caries as well as in diabetic patients.

**Conclusion:** From the present study, it was evident that serum levels of alkaline phosphatase show a positive relationship with diabetes and dental caries.

# Evaluation of CAT Score in a Cross-sectional Study of Construction Site Workers with COPD: A Retrospective Analysis

Abstract-69

**R Leela Bhavani, Department of Physiology, Sree Balaji Medical College and Hospital, Chromepet, Chennai, Tamil Nadu, India.**

**R Archana, Department of Anatomy, Sree Balaji Medical College and Hospital, Chromepet, Chennai, Tamil Nadu, India.**

**S Sasi Kumar, Department of Physiology, Sree Balaji Medical College and Hospital, Chromepet, Chennai, Tamil Nadu, India.**

**Introduction:** Pulmonary Function Tests (PFTs) are commonly utilised to gauge lung function and diagnose Chronic Obstructive Pulmonary Disease (COPD). The COPD Assessment Test (CAT) is a questionnaire utilised to evaluate COPD's impact on health status.

**Aim:** To examine the relationship between PFT interpretation, COPD severity, and CAT scores.

**Materials and Methods:** A retrospective analysis was conducted in Sree Balaji Medical College and Hospital, Chromepet, Chennai, Tamil Nadu, India, between April 2023 to November 2023, on PFT results and CAT scores of 200 construction site workers with COPD. PFTs were categorised into three severity levels: mild obstruction, moderate obstruction, and severe obstruction. CAT scores were classified as mild, moderate or severe based on predefined thresholds.

**Results:** The distribution of PFT interpretation and CAT scores within each COPD severity level was calculated. Among the study population, 13% had mild obstruction, 54% had moderate obstruction, and 33% had severe obstruction based on PFT interpretation. In terms of CAT scores, all patients with mild PFT obstruction had mild CAT scores, while those with moderate PFT obstruction had moderate CAT scores (100%). Similarly, patients with severe PFT obstruction had severe CAT scores (100%). Overall, the distribution of CAT scores corresponded with the severity of PFT obstruction.

**Conclusion:** These findings highlight the usefulness of combining PFT results with CAT scores for a comprehensive evaluation of COPD severity and its impact on patients' well-being. Incorporating both PFTs and CAT scores in clinical practice can aid in treatment decisions and monitoring the progression of COPD.

# A Comparative Study of Carotid Femoral Pulse Wave Velocity in Pre and Postmenopausal women in Jodhpur, Rajasthan, India

Abstract-70

**Divya Harsh, Raghuveer Choudhary, Kamla Choudhary  
Department of Physiology, Dr. SN Medical College, Jodhpur, Rajasthan, India.**

**Introduction:** Cardiovascular Disease (CVD) is the number one cause of death for both men and women. Arterial stiffness is caused by structural and functional changes within the arterial walls, resulting in an increased Pulse Wave Velocity (PWV) which is a reliable indicator of vascular damage and early atherosclerosis. Although premenopausal women are relatively protected from CVD, the incidence increases disproportionately in women after menopause. Menopause may augment age-dependent increases in arterial stiffness impacting their risk of CVD later in life.

**Aim:** To assess and compare Pulse Wave Velocity in pre and postmenopausal women.

**Materials and Methods:** This case-control comparative observational study was conducted in the Department of Physiology, Dr. SN Medical College, Jodhpur, Rajasthan, India, between January 2023 to June 2023, including 80 subjects, 40 premenopausal and

40 post-menopausal subjects aged 45-65 years. Anthropometric parameters like height, weight, waist-to-hip ratio, body mass index) and cardiovascular parameters (pulse pressure and heart rate) were measured. Lipid profile tests (total cholesterol, triglycerides, High-density lipoprotein cholesterol) were performed by Robonik automatic biochemical auto-analyser. Arterial stiffness was measured by PWV using a Periscope based on oscillometer technique.

**Results:** Independent student's t-test predicted a significant increase in C-F PWV for the Post-menopausal group ( $p < 0.05$ ) showing augmentation in PWV which indicated increased risk of CVD.

**Conclusion:** The present study among post-menopausal women showed that PWV of carotid-femoral arteries was linked to increased cardiovascular risks. Additionally, it highlighted the importance of assessing arterial stiffness as a marker of these risks.



# Comparison of Motor Nerve Conduction Velocity of Median Nerve Males and Females: A Comparative Study

**Swetha Krishnan, Postgraduate, Upgraded Department of Physiology, Osmania Medical College, Hyderabad, Telangana, India.**

**O Padmini, Professor and Head, Upgraded Department of Physiology, Osmania Medical College, Hyderabad, Telangana, India.**

**Geetha Shavali, Associate Professor, Upgraded Department of Physiology, Osmania Medical College, Hyderabad, Telangana, India.**

**Introduction:** Nerve Conduction Study (NCS) is a part of electro-diagnostic procedures that help in establishing the type and extent of the abnormality of the nerves. NCS data interpretation is influenced by some physiological factors such as gender, height, hand dominance etc.

**Aim:** To compare the motor nerve conduction velocity of the median nerve in both upper limbs of males and females.

**Materials and Methods:** This comparative study was conducted in the Upgraded Department of Physiology, Osmania Medical College, Hyderabad, Telangana, India, between May 2023 to October 2023, in which a total of 60 right-handed subjects including 30 females and 30 males aged between 17-30 years without any co-morbidities were taken as the study population. Anthropometric measurements of the subjects were recorded. Nerve conduction study of the median nerve was done. The values obtained were tabulated and compared between males and females.

**Results:** The values were statistically analysed using independent sample t-test. The mean conduction velocity of the median nerve in the dominant limb in males and females were 62.77 m/s and 61.38 m/s, respectively. The p-value obtained was 0.1281 which was statistically insignificant. The mean conduction velocity of males and females in the non dominant limb were 59.75 m/s and 62.23 m/s, respectively. The p-value obtained was 0.02376 which was statistically significant. The mean conduction velocity in the dominant limb was higher in males, while in the non dominant limb, it was higher in females.

**Conclusion:** Gender has definite effects on nerve conduction velocity of the median nerve. This difference may be attributed to the difference in heights between both genders and hand dominance. Hence, suggesting that different cut-off values for the two genders may be needed for interpreting such studies.

# Alteration in Glycated Haemoglobin Levels in Non Diabetic Adult Individuals with Abnormal Thyroid Status: A Case-control Study

**Sonika, Postgraduate Student, Department of Physiology, Government Medical College (GMC), Nalgonda, Telangana, India.**

**Introduction:** Glycated Haemoglobin (HbA1c) has been considered as an important marker of long-term glycaemic control. The American Diabetes Association has suggested use of HbA1c as diagnostic tool for prediabetes and diabetes. A value between 5.7% and 6.5% represents prediabetes, while a value greater or than equal to 6.5% is considered as diabetes mellitus. HbA1c levels may change due to altered thyroid status. HbA1c levels in hypothyroid and thyrotoxic individuals who do not have diabetes or prediabetes based on fasting and 2-hour post glucose plasma, the glucose criteria is measured. Studies done in hypothyroid patients have shown elevated HbA1c not only in presence of diabetes but also in non diabetic subjects. HbA1c levels in hyperthyroid patients were not significantly different from controls.

**Aim:** To evaluate effect of thyroid status on glycated haemoglobin levels.

**Materials and Methods:** A case-control study was conducted in the Department of Physiology, Government Medical College (GMC), Government General Hospital (GGH), Nalgonda, Telangana, India, with the help of Department of Medicine, Department of Biochemistry and Department of Pathology, between August 2023 and October 2023. A total of 120 participants of age group 21-70 years were taken, with 60 cases (non diabetic with abnormal thyroid status, Fasting Blood Sugar (FBS) <110 mg/dL) and 60 controls. Parameters like FBS, Haemoglobin (Hb), Triiodothyronine (T3), Thyroxine (T4), Thyroid Stimulating Hormone (TSH), HbA1c were collected, before and after treatment and were evaluated. All values were given as mean±SD. Comparison between cases and control groups were made using Student's t-test (unpaired) and p-value less than 0.05 was considered statistically significant. For the study, blood sample, glucometer, injections were needed.



**Results:** There was a positive and statistically significant correlation between serum TSH and HbA1c levels. HbA1c levels were higher in subclinical hypothyroids.

**Conclusion:** HbA1c reduced significantly with treatment in hypothyroid patients, without any significant change in glucose levels, unlike in hyperthyroid patients.

## The Association between Screen Time and Choice Reaction Time in College Students

Abstract-73

**Meraj Ahmad, Ajay Bhatt, Ajay Soni.**

**Department of Physiology, MGM Medical College, Indore, Madhya Pradesh, India.**

**Introduction:** This study explores the association between screen time and choice reaction time in college students, considering the potential impact of screen exposure on cognitive performance.

**Aims and Objectives:** The aim of this research was to determine whether there was a significant relationship between screen time and choice reaction time among adult college students.

**Materials and Methods:** The present study was a cross-sectional study conducted from September 2022 - September 2023. Data were collected from 147 adult college students. Screen time was measured in hours spent on electronic devices, and choice reaction time was assessed using a standardised test. Pearson correlation analysis was employed to examine the association between these variables.

**Results:** The Pearson correlation analysis revealed a strong and significant positive association ( $r$ -value=0.599,  $p$ -value <0.01) between screen time and choice reaction time in adult college students.

**Conclusion:** This study rejects the null hypothesis, providing evidence of a significant association between screen time and choice reaction time in this population. Increased screen time appears to be linked to slower choice reaction time, emphasising the need to consider the effects of screen exposure on cognitive performance.

**Keywords:** Cognitive performance, Electronic devices, Screen exposure

## To Study the Heart Rate Variability in Type 2 Diabetes Mellitus Subjects having Hypothyroidism

Abstract-74

**MK Brahmabhatt, PG Student, RUHS College of Medical Science, Jaipur.**

**Rajprabha, Professor and Head, Department of Physiology, RUHS College of Medical Science, Jaipur.**

**P Dhakar, Associate Professor, Department of Medicine, RUHS College of Medical Science, Jaipur.**

**Introduction:** Thyroid disorders are common in the general population and it is second only to diabetes as the most common endocrine disorder. As a result, it is very common for an individual to be affected by both thyroid diseases and diabetes. The cardiovascular system is affected by variations in thyroid levels of an individual.

**Aim and Objectives:** To study the effect of hypothyroidism on heart rate variability in patients having type 2 diabetes mellitus.

**Material and Methods:** This study was conducted in Department of Physiology and associated hospitals, RUHS College of medical sciences Jaipur, Rajasthan, India, on diabetic subjects having hypothyroidism with age group above 30 years. Heart rate variability was recorded by using digital physiography by AD instruments.

Data was analysed by using appropriate tests and  $p$ -value <0.05 considered as statistically significant.

**Results:** Analysis showed that out of total evaluated diabetic subjects (107), 25 subjects had hypothyroidism (TSH=  $5.56 \pm 2.87$ ) with type 2 diabetes mellitus. The mean  $\pm$  SD of heart rate variability parameters were: LF ( $62.08 \pm 5.82$ ), HF ( $38.02 \pm 8.67$ ), LF/HF ( $1.63 \pm 0.68$ ).

**Conclusion:** Autonomic nervous system is affected in hypothyroidism with co-morbidities like diabetes mellitus which increases the risk for cardiovascular diseases and heart rate variability may be useful in screening early diagnosis of such co-morbidities.

**Keywords:** Autonomic nervous system, Cardiovascular diseases, Thyroid disorders

# A Study for Assessing Auditory Interference on Simple Reaction Time in Youth of Andhra Pradesh, India

Abstract-75

Ankita Singh, 2nd Year Postgraduate, Department of Physiology, Government Siddhartha Medical College, Vijayawada, Andhra Pradesh, India.

W Maruthi, Professor and Head, Department of Physiology, Government Siddhartha Medical College, Vijayawada, Andhra Pradesh, India.

**Introduction:** With the increased daily use of background music and cell phone conversations by youth while driving, this study aims to shed light on the potential consequences on reaction time. Reaction time is an important method used to assess a person's central information processing speed and their ability to produce fast, coordinated peripheral movement responses.

**Aims and Objectives:** To estimate the effects of low volume auditory interference on Visual Reaction Time (VRT) and Auditory Reaction Time (ART). To estimate the effects of phone conversation on VRT and ART. To find out gender difference and stimulus difference reaction time.

**Materials and Methods:** A cross-sectional study was conducted among 200 youth (100 females and 100 males) aged 21-24 years in a teaching college from March-July 2023. This study used Psychotronics 501-004TR Digital Reaction Time Apparatus. After obtaining consent, participants ART and VRT were assessed. Dual-

task scenarios involved low-volume background music and phone conversations on topics of interest. Final data were analysed using Statistical Package for Social Sciences (SPSS).

**Results:** The mean of VRT and ART of study population was  $191.5 \pm 13.91$  milliseconds and  $166.4 \pm 8.9$  milliseconds, respectively. VRT after low music was  $189.3 \pm 14$  milliseconds while on phone conversation increased to  $197.5 \pm 15.1$  milliseconds. ART after low music was  $199.3 \pm 10.7$  milliseconds while on phone conversation increased to  $188.7 \pm 11.6$  milliseconds ( $p$ -value  $< 0.05$ ). Overall, values were same in both genders.

**Conclusion:** Study underscores impact of auditory interferences in affecting both reaction times. Practically the impact of reaction times bears critical repercussions on driving, where split-second decisions make life-saving difference.

**Keywords:** Auditory reaction time, Peripheral movement responses, Visual reaction time

# Umbilical Cord Blood Screening for White Blood Cell Variables in Newborns

Abstract-76

Salma Sultana, Department of Physiology, Regional Institute of Medical Sciences, Imphal, Manipur.

**Introduction:** Haematology of newborn recently represents as an area of study that focuses in the study of umbilical cord blood and its elements in it. White blood cells count is also helpful in the assessment of neonatal sepsis of newborn. Various studies suggests that umbilical cord blood has increase leucocyte count at birth.

**Aims and Objectives:** 1) To study white blood cell variables of umbilical cord blood of newborn. 2) To establish white blood cell variables among both the gender.

**Materials and Methods:** The present study was a cross-sectional study conducted at the Department of Physiology, RIMS, Imphal, Manipur, India. A total of 110 newborns were taken in this study. After explaining the procedure, informed written consent was taken

from the mothers. Under aseptic condition 2 mL of umbilical cord blood sample were collected and immediately kept in a EDTA vial and all relevant data were entered in the restructured proforma.

**Results:** Total leucocyte count was higher in male newborns than females. There were no statistically significant differences found in lymphocyte count, monocyte count and granulocyte count between male and female newborns in the present study.

**Conclusion:** In this present study out of 110 majority were male newborns. This was a preliminary study. Therefore, further studies are needed to evaluate white cell parameters variations in different genders with a larger sample size.

**Keywords:** Haematology, Neonatal sepsis White cell parameters

# Effect of Eye Exercise on Visual Field and Visual Reaction Time

Abstract-77

MA Hariviknesh, S Anu, Noel Naveen Johnson

Department of Physiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.

**Introduction:** Continuous viewing of digital screens, prolonged eye straining during studying, and people who work with constant eye straining like goldsmith, IT Professionals etc. are frequently afflicted by visual problems. Visual field represents portion of the retina utilised for normal viewing. This area varies with age and usage. Studies have documented the results of eye exercises improving refractive errors and Visual Reaction Time (VRT). This study aims to find whether eye exercises improve field of vision in comparison to visual reaction time.

**Aim and Objectives:** To find the effect of 15 minutes of eye exercises on visual field and VRT among healthy subjects.

**Materials and Methods:** This interventional study involved 40 students of both the gender in the age group of 18-22 years. Student's visual fields were assessed using Priestly Smiths Perimeter

(PSP) and VRT for green and red colour was noted. Students were asked to exercise their extra ocular muscles for 15 minutes by following the 12, 3, 6 and 9 position of a wall in the room with a 2 second gap between each position. They were then subjected to PSP and VRT again.

**Results:** A significant increase in values of temporal ( $p$ -value  $<0.002$ ) and superior field ( $p$ -value  $<0.003$ ) was observed with no significant change in nasal and inferior field of vision. Reaction time for red colour showed a significant decrease ( $p$ -value=0.023) with no significant change for green colour.

**Conclusion:** Short duration eye exercises improved the visual fields in nasal and temporal fields and shortened VRT for red colour.

**Keywords:** Digital screens, Field of vision, Priestly Smiths perimeter.

# Effect of Fast and Slow Pranayama on Cardiovascular Parameters in Young Individuals

Abstract-78

T Vijayalakshmi, K Kanchana

Institute of Physiology, Madurai Medical College, Madurai, India.

**Introduction:** Stress is the state of mental or emotional strain from various circumstances, is reported higher in younger individuals, which affects their health badly. Practising pranayama and meditation lowers cardiovascular mortality, reduces stress. Pranayama has very important role in maintaining good Cardiovascular System (CVS), respiratory health and mental relaxation.

**Aims and Objectives:** To compare the effect of fast and slow pranayama training on cardiovascular parameters in young individuals.

**Materials and Methods:** Ninety healthy volunteers in age group of 18-25 years both sex were recruited for the study. Subjects with respiratory illness, skeletal deformities, athletes, previous yoga practices, smokers, alcoholic, any recent surgery were excluded from study. Informed written consent obtained from each subject, after explaining study procedure. Volunteers were randomly divided into three groups. Group 1 (30) practiced fast pranayama (kapalabhati, bhastrika, kukkriya) Group 2 (30) practiced slow pranayama (nadishodhana, Pranava, savitri) Group 3 (30) did not practice any

pranayama. Resting cardiovascular parameters-Baseline Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Heart Rate (HR) were, recorded on semiautomatic BP monitor. Pulse pressure, Mean arterial pressure, Rate pressure product, DoP were calculated for each recording. Three readings were taken and the lowest of these values were included for the study. Twelve weeks of supervised pranayama training for 30 mins, thrice/week conducted by a certified Yoga trainer at Thiruvallur. After completion of training all above CVS parameters were recorded. Statistical analysis done using Statistical Package for Social Sciences (SPSS) software 25.0. Mean $\pm$ SD of scores calculated. The  $p$ -value  $<0.05$  was considered as significant.

**Results:** Significant decrease in SBP, HR, DBP, RPP, MAP and DoP seen only in Group 2 subjects. Group1 showed insignificant decrease in CVS parameters. Group 3 showed no change.

**Conclusion:** This study showed beneficial effect on CVS parameters occurred by practicing slow pranayama.

**Keywords:** Cardiovascular system, Mental relaxation, Stress.

# Comparative Study of Visual Evoked Potential and Cortical Auditory Evoked Potential in Parkinson's Disease Patients and Age-matched Controls to Assess the Cognitive Decline

**Niveditha Shatheesh, S Anu, Department of Physiology, Velammal Medical College Hospital and Research Center, Madurai, Tamil Nadu, India.**

**M Kavitha, Department of Neurology, Velammal Medical College Hospital and Research Center, Madurai, Tamil Nadu, India.**

**Introduction:** As people age, brains shrink, leading to mild cognitive loss, especially in areas like temporal lobes and prefrontal cortices. This can cause hard-of-hearing and poor speech discrimination among the elderly. Parkinson's Disease (PD), being a neurodegenerative disorder, increases the likelihood of patients developing dementia earlier than the normal physiological process.

**Aims and Objectives:** To measure the P100 and P300 latencies of Visual Evoked Potential (VEP) and Cortical Auditory Evoked Potential (CAEP) respectively and correlate their efficacy as an indicator of cognitive decline in PD patients by correlating with Montreal Cognitive Assessment (MoCA) scores.

**Materials and Methods:** The present study was a comparative study conducted with 50 patients (Group A - 25 PD patients and Group B - 25 age-matched controls) from July 2022 to September 2022. The PD patients were further subdivided into mild, moderate and severe categories by the Movement Disorder Society-Sponsored Revision of the Unified Parkinson's Disease Rating Scale

(MDS-UPDRS) scale. Group A and B's evoked potentials and MoCA scores were recorded using Allengers Evoked Potential Analyser.

**Results:** A significant increase was noted in the latencies of P100 (right side p-value=0.014 and left side p-value=0.003) and P300 (p-value=0.005) values in PD patients compared to their age-matched controls. The amplitude of P300 showed an increase (p-value=0.001) in PD patients compared to the controls while the amplitude of P100 did not.

**Conclusion:** PD patients have longer latencies of the P300 and P100 components of CAEP and VEP. P300 values showed a significant increase in amplitude, while P100 values showed no discernible change. The delayed P300 latency was inversely correlated with MoCA scores. The latency delay indicates early cognitive decline in PD patients, aiding in early diagnosis and improved quality of life.

**Keywords:** Montreal cognitive assessment scores, Neurodegenerative disorder, Physiological process

# Effect of Hunger, Satiety and Exercise on Taste and Smell Threshold

**S Manishankar, S Anu**

**Department of Physiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.**

**Introduction:** "Hunger is the best sauce in the world"- a common saying we all grew up listening. It is generally recommended to eat only when hungry. In the fast-paced modern world, people tend to eat according to the physical clock rather than the biological clock of hunger leading to complications like obesity. Obesity decreases taste and smell perception leading to indulgence in overeating as a compensation continuing the vicious cycle. It is hypothesised that hunger decreases taste and smell threshold, and fullness is achieved earlier thereby preventing overeating and obesity. The effect of acute aerobic exercise was also expected to have a similar impact as that of hunger.

**Aims and Objectives:** 1. To assess and compare the taste and smell threshold in hunger and satiety. 2. To analyse the impact of short-term exercise on taste threshold from a state of satiety.

**Materials and Methods:** This study includes 100 medical students (both genders), of age between 17-20 years. For taste, sip spit rinse

test was performed using sweet, salt, sour and bitter solutions of different concentrations (0.05-0.003125 g/mL). Odour threshold was measured with various dilutions of rose water (1:100000 to 1:1) using olfactometer. Results were analysed using repeated measures Analysis of Variance (ANOVA). Acute aerobic exercise was performed using cycle ergometer.

**Results:** A statistically significant decrease in sweet threshold was observed in hunger (p-value <0.001) and after exercise (p-value <0.001), whereas a statistically significant increase in threshold of sour sensation was observed in hunger (p-value <0.004) and after exercise (p-value <0.003). No statistically significant change was observed in threshold of salt, bitter and smell sensation.

**Conclusion:** In both hunger and after exercise, there is increase in sweet and decrease in sour sensitivity with no changes in salt, bitter and smell threshold.

**Keywords:** Aerobic exercise, Obesity, Vicious cycle.

# The Effect of Acupressure on Pain Perception and Pain Threshold in Patients of Rheumatoid Arthritis

Abstract-81

**R Oviya Vallabi, S Anu****Department of Physiology, Velammal Medical College Hospital and Research Institute, Madurai, Tamil Nadu, India.**

**Introduction:** Rheumatoid Arthritis (RA) is a chronic inflammatory disorder involving painful joints as a serious manifestation. Acupressure consists of pressing the specific local points in an attempt to acquire the desired effect. Acupressure is found to be effective in condition like insomnia, stress management, headache, menstrual cramps, motion sickness and musculoskeletal pain. This study aimed to find out the effect of acupressure on pain perception and pain threshold.

**Aims and Objective:** To measure the effect of acupressure on pain perception and pain threshold on rheumatoid arthritis patients. To assess the maximum time taken for changes in threshold in patients of RA patients.

**Materials and Methods:** This interventional study was done for one month i.e. May 2023 on 50 rheumatoid arthritis patients in rheumatology OP of private medical college of Madurai involving

both the genders. Pain threshold was measured using digital algometer immediately after acupressure intervention, after 15 minutes, after 30 minutes and 45 minutes. Pain perception was measured using a Visual Analog Scale (VAS). Results were analysed using Analysis of Variance (ANOVA).

**Results:** Significant increase in pain threshold ( $p$ -value  $\leq 0.01$ ) was observed within 30 minutes of acupressure intervention along with decrease in pain perception (a difference of 4 scores are seen in VAS).

**Conclusion:** Decrease in pain sensation was noted within 30 minutes of intervention. This could be used as an adjuvant to relieve pain in RA patients.

**Keywords:** Chronic inflammatory disorder, Stress management, Musculoskeletal pain.

# Effect of Sleep on Auditory and Visual Reaction Time among Medical Students

Abstract-82

**SK Siddarth Malaiaah , S Anu****Department of Physiology, Velammal Medical College Hospital and Research Center, Madurai, Tamil Nadu, India.**

**Introduction:** Sleep gets affected when the students enter MBBS due to academic overload and methodologies that differ from school. Students fail to accommodate to the change and their sleep gets affected. Reaction Time (RT) is defined as the interval of time between the presentation of the stimulus and appearance of appropriate voluntary response in the subject. RT shows the intactness of the nervous system. Sleep deprivation is proved to affect cognition.

**Aims and Objectives:** To assess the effect of sleep on auditory and visual reaction time among medical students.

**Materials and Methods:** The present observational cross-sectional study was conducted on 60 1<sup>st</sup> year MBBS students of normal

Body Mass Index (BMI) based on their sleep quality via Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale. Then their auditory and visual reaction time was measured using choice reaction timer.

**Results:** Auditory reaction time had significantly increased in the sleep deprived students ( $p$ -value  $< 0.002$ ). Visual reaction time for both red ( $p$ -value  $< 0.001$ ) and green light ( $p$ -value  $< 0.002$ ) also had significantly increased when compared to individuals with normal sleep.

**Conclusion:** Sleep deprivation increases auditory and visual reaction time. This decreases the focus and attention of the students.

**Keywords:** Attention, Focus, Sleep deprivation.



# BIOCHEMISTRY ABSTRACTS

## Effect of Particulate Matter PM2.5 in Granuloma Formation and Reactivation of Latent Tuberculosis

Abstract-83

**P Athisankaran, Sadhna Sharma, Department of Biochemistry, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.**

**Ravindra Khaiwal, Department of Community Medicine, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.**

**Uma Nahar Saikia, Department of Histopathology, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.**

**Sumedha Sharma, Kushpreet Kaur, Indu Verma, Department of Biochemistry, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.**

**Introduction:** Exposure of particulate matter PM2.5 adversely provokes numerous respiratory diseases and also effects infectivity in tuberculosis.

**Aims and Objectives:** This study hypothesises that exposing PM2.5 to immune cells in the presence of mycobacteria as well as exposure of PM2.5 to preformed tuberculous granuloma will prevent the tuberculous granuloma formation and also can lead to reactivation of latent bacilli, respectively.

**Materials and Methods:** It was a cross sectional study conducted over a period of two years based on the initial standardisations to collect PM2.5, isolating Peripheral Blood Mononuclear Cells (PBMCs) followed by assessing its viability against different PM2.5 concentration using MTT assay and developing an in-vitro granuloma model using *Mycobacterium bovis* BCG with multiplicity of infection (MOI - 0.1) in extracellular matrix using RPMI-1640 media in 96 well plates, the expression of dormancy-associated mycobacterial genes like tgs 1, icl and hspX and reactivation-associated gene rpf B were studied. Seven human cytokines produced by Th1, Th2 and Th17 cells from culture supernatant were analysed by flowcytometry. The extracellular

matrixes containing the tuberculous granuloma were subjected to histopathological examinations (HE and Ziehl-Neelsen staining) and also to enumerate Colony Forming Units (CFUs) in 7H11 agar plates.

**Results:** The granulomas formed in the presence of PM2.5 were loosely packed and ill-defined with significant downregulation of dormancy-associated genes, upregulation of reactivation-associated gene along with a significant increase in Tumour Necrosis Factor  $\alpha$  (TNF- $\alpha$ ) level. In the preformed granulomas when treated with PM2.5, granuloma architecture was disrupted along with downregulation of dormancy-associated genes and reactivation-associated gene, and with no significant change in human cytokine levels. However, in both the approaches no significant changes were observed in CFUs count.

**Conclusion:** It can be concluded that particulate matter PM2.5 can interrupt the tuberculous granuloma formation in-vitro as well as alters mycobacterial gene expression and inflammatory cytokines that contain the bacilli in granulomatous form, establishing a vital role of PM2.5 in reactivation of latent tubercle bacilli.

**Keywords:** Granulomas, Inflammatory cytokines, Respiratory diseases.

## Association of Irisin with Insulin Resistance in Type 2 Diabetes Mellitus

Abstract-84

**Saffalya Nayak, Department of Biochemistry, SCB Medical College and Hospital, Cuttack, India.**

**Pratima Kumari Sahu, Department of Biochemistry, SCB Medical College and Hospital, Cuttack, India.**

**Debjyoti Mohapatra, Department of Community Medicine, SJ Medical College and Hospital, Cuttack, India.**

**Introduction:** The escalating prevalence of Type 2 Diabetes Mellitus (T2DM) and its complications has heightened the economic burden globally, with India ranking as the world's second-highest diabetic population, earning the title of the "diabetic capital". Insulin resistance is a central factor in T2DM development. Irisin, an adipomyokine, is recognised for its potential to enhance insulin sensitivity through adaptive thermogenesis.

**Aims and Objectives:** The primary objectives of this study were to explore the association of serum irisin with insulin resistance in individuals recently diagnosed with T2DM and compare with age and sex matched healthy individuals.

**Materials and Methods:** This case-control study, with six months study duration comprising 180 participants and conducted with the approval of the institutional ethical committee, involved the

measurement of fasting blood glucose levels, quantification of serum insulin using a chemiluminescence assay, and assessment of serum irisin levels through an Enzyme Linked Immunoassay (ELISA) kit. Additionally, insulin resistance was determined utilising the Homeostatic Model Assessment of Insulin Resistance (HOMA-IR).

**Results:** Present study findings revealed significantly diminished irisin levels in T2DM patients compared to healthy individuals

( $p$ -value=0.001). Notably, a positive correlation was observed between serum irisin and insulin resistance in T2DM patients, while a negative association was identified in the healthy control group.

**Conclusion:** In conclusion, present study suggests a potential protective role of irisin in mitigating insulin resistance in T2DM. However, larger-scale studies are imperative to definitively establish this association.

**Keywords:** Adipomyokine, Diabetic capital, Thermogenesis.

Abstract-85

## The Antioxidant Status and Free Radical changes in Preeclampsia and in Normal Pregnancy

**KV Kanagalakshmi, Senior Resident, Department of Biochemistry, Vinayaka Mission's Medical College, Karaikal. J Jaiprabu, Professor and Head, Department of Biochemistry, Vinayaka Mission's Medical College, Karaikal.**

**Introduction:** Preeclampsia is best described as pregnancy specific syndrome that can affect virtually every organ system. It is defined as Blood Pressure more than 140/90 mm Hg, after 20 weeks of gestation in previously normotensive women with proteinuria (300 mg or more in 24 hours urine sample). Placental oxidative stress may be the main cause of preeclampsia along with lipid peroxidation.

**Aims and Objectives:** To analyse the level of oxidative stress marker malondialdehyde (MDA), antioxidants such as Ascorbic acid, Tocopherol, Superoxide Dismutase (SOD) in preeclampsia and in normal pregnancy.

**Materials and Methods:** It was a case-control study conducted for one year duration in Vinayaka mission's medical college and hospital, Karaikal. Fifty preeclampsia pregnancy (cases) and 50 normal pregnancy (controls) in the age group of 20-35 years were

selected. Levels of Vitamin C, Vitamin E, SOD, lipid profile, plasma MDA, Uric acid were analysed.

**Results:** In preeclampsia, the levels of MDA was increased and levels of Vitamin C, E and SOD were decreased. Increased uric acid levels were also observed in cases. BMI was increased in cases. LDL, TGL and total cholesterol levels were increased whereas HDL level was decreased in cases.

**Conclusion:** In preeclamptic patients antioxidants are utilised to a greater extent to counteract free radical mediated cellular changes, resulting in the reduction of plasma antioxidant levels. So early use of antioxidants in high risk pregnancy may reduce the course of complications.

**Keywords:** Blood pressure, Oxidative stress, Proteinuria.

## Mathematical Models for Assessing Glycaemic Control in Type 2 Diabetes Mellitus

Abstract-86

**Anitha Misquith, Department of Biochemistry, Sapthagiri Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, India. Harish Rangareddy, Department of Biochemistry, Haveri Institute of Medical Sciences, Haveri, Karnataka, India. Ayesha Sultana, Department of Pathology, St. George's University School of Medicine, St. George's, Grenada. Ashakiran Srinivasaiah, Department of Biochemistry, Haveri Institute of Medical Sciences, Haveri, Karnataka, India.**

**Introduction:** Glycated haemoglobin (HbA1c) and glycated albumin (GA) are vital markers for long-term glucose control in individuals with diabetes. While HbA1c is commonly measured, calculated HbA1c and calculated GA provide alternative methods for assessing glycaemic control.

**Aims and Objectives:** This study aims to compare calculated HbA1c with directly measured HbA1c and assess the agreement between the two methods using regression analysis. The study also aimed to correlate calculated GA with the measurands of glycaemic control in type 2 diabetes mellitus.

**Materials and Methods:** The present cross-sectional study conducted for 18 months duration included a total of 901 diagnosed

type 2 diabetic patients. HbA1c levels were measured using National Glycohaemoglobin Standardisation Program (NGSP) certified method, and HbA1c was calculated using the formula  $HbA1c = 2.6 + 0.03 \times FBS$  (mg/dL). Estimated average glucose (eAG) was calculated using the formula  $eAG = 28.7 \times HbA1c - 46.7$ . Simultaneously, GA was calculated using the equation  $HbA1c \times 3.1$ . Statistical analysis was performed using MedCalc v22.014 and  $p$ -value  $< 0.05$  was considered statistically significant.

**Results:** Kolmogorov-Smirnov test showed that the data was not normally distributed and hence non parametric tests were performed. Spearman's correlation coefficient revealed a strong correlation of calculated HbA1c, calculated GA and estimated average

glucose with the measured parameters. Wilcoxon rank sum test to compare the HbA1c and calculated HbA1c showed Calculated HbA1C<HbA1C (Negative ranks=552), Calculated HbA1C>HbA1C (Positive ranks=314) and Calculated HbA1C=HbA1C (Ties=35). Test statistic Z -9.487033 and p-value <0.0001 suggesting significant difference between the inferential method and direct measurement of HbA1c. Passing Bablok regression analysis showed significant deviation from linearity.

**Conclusion:** Mathematical formulae may help patients minimise the additional costs in resource poor setting. Though the calculated parameters reflect on the glycaemic status of the patient interchangeable usage of the calculated HbA1c and estimated HbA1c may not be appropriate for clinical decision making.

**Keywords:** Bablok regression analysis, Glycated haemoglobin, Kolmogorv-Smirnov test.

Abstract-87

## Association of Neutrophil-Lymphocyte Ratio and Bsm-I Vitamin D Receptor Gene Polymorphism among Chronic Kidney Disease Patients in Puducherry, India

**B Ramya, Department of Biochemistry, Sri Manakula Vinayagar Medical College and Hospital, Puducherry, India.**  
**S Asmathulla, Department of Biochemistry, AIIMS, Madurai, Tamil Nadu, India.**  
**Ravikumar, Department of Nephrology, SMVMC, Puducherry, India.**

**Introduction:** Vitamin D is a fat soluble vitamin, it requires Vitamin-D Receptor (VDR) for eliciting its biochemical functions. VDR gene is responsible for production of VDR. Active form of vitamin D is synthesised in kidney, thus renal tissue plays a vital role in VDR axis regulation. Any polymorphism of VDR gene causes glomerular dysfunction, thus leading to renal failure.

**Aims and Objectives:** To find the allelic and genotypic frequency of Bsm-I VDR gene among Chronic Kidney Disease (CKD) patients. To find the association between Neutrophil-Lymphocyte Ratio (NLR) and Bsm-I VDR gene polymorphism in CKD patients.

**Materials and Methods:** This was a case-control study, conducted for two years duration which included 100 cases and 100 controls. Bsm-I VDR gene analysis was done by Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) method. All the statistical analysis was done by Statistical Package for Social Sciences (SPSS) software version 24.0.

**Results:** Among 100 CKD study participants, BB (wild type) genotype of Bsm-I gene was present in 3 patients (3%), Bb (heterozygous) genotype was present in 17 patients (17%) and bb (mutant) genotype was present in 80 patients (80%). Among 100 controls, 97 subjects were found to have BB genotype, three subjects were found to have Bb genotype and none of the subjects were found to have bb genotypes. Present study found that CKD patients with Bsm-I gene polymorphism were having very high NLR values compared to the control group.

**Conclusion:** This was the first South Indian genetic study to reveal that individual not associated with Diabetes and Hypertension can also develop CKD with underlying genetic predisposition. And 'b' allele of Bsm-I gene; Bb and bb genotypes of Bsm-I gene plays a greater role in Guanine/Adenine single nucleotide polymorphism of Bsm-I gene among CKD patients in Puducherry, India.

**Keywords:** Genetic predisposition, Renal failure, Renal tissue.

Abstract-88

## Effect of Various Concentrations of Iodine on Fischer Rat Thyroid Cell Line

**Suresh Pichandi, Professor, Department of Biochemistry, Sri Venkateswara Medical College and Research Centre, Puducherry, India.**  
**Janakiraman, Assistant Professor of Statistics, P.E.S. Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh, India.**  
**K Ramadevi, Professor, Department of Biochemistry, Government Villupuram Medical College, Tamil Nadu, India.**

**Introduction:** Thyroid hormones are produced in the thyroid gland for which iodine is provided from the dietary intake. Excess intake of iodine rich foods is also associated with thyroid dysfunctions, autoimmune thyroiditis being the most common apart from malignancy of the thyroid. The Fischer Rat Thyroid cell Line (FRTL) was used in the present study.

**Aims and Objectives:** In order to understand the exact mechanism of iodine excess on the thyroid cell we have proposed to study the changes that may occur on Thyroid cell lines that are subjected to varying concentrations of iodine.

**Materials and Methods:** This was an experimental study conducted over a period of 18 months. FRTL cells were treated with different concentrations of potassium iodide (KI) from 1 micro mole/L to 10 milli mole/L (1  $\mu$ M to 10 mM) from 2 h to 5 days. Effects of iodine concentration with different time period were studied.

**Results:** It was observed that viability of cells was maximum at concentration of 1  $\mu$ M of KI throughout the study. At the end of the study period of five days 75% viability was available. At 10  $\mu$ M of KI, the viability of cells ranged from 76% to 68% at the end of five days. Concentrations above 10  $\mu$ M were not compatible as the viability was less than 50% even at 2 hours duration.

**Conclusion:** It was observed that the thyroid cell lines had maximal viability at 1  $\mu$ M of KI. As the concentration of the KI was increased, the viability decreased. This suggests that a high concentration of iodide is toxic to the cell resulting in cellular malfunctioning and ultimately death. The excess iodine is known to trigger auto immunity. Depending on the type of antibodies produced, the patient may present with either hypothyroidism or hyperthyroidism with or without goitre.

**Keywords:** Antibodies, Cellular malfunctioning, Thyroid dysfunctions.

## Evaluation of Serum Adenosine Deaminase and Gamma Glutamyl Transferase in Cancer Cervix- A Low-cost Diagnostic Tool

Abstract-89

T Vivian Samuel, Department of Biochemistry, JJM Medical College, Davangere, Karnataka, India.  
S Smilee Johny, Department of Physiology, JJM Medical College, Davangere, Karnataka, India.

**Introduction:** Cancer cervix is one of the leading causes of death in women worldwide. It is a slow progressive carcinoma and if detected early mortality can be reduced. Most cases occur in low economic women and in developing countries. So, if a low-cost diagnostic tool is utilised it can be detected early.

**Aims and Objectives:** To estimate serum adenosine deaminase and gamma glutamyl transferase activity in carcinoma cervix patient and in healthy controls.

**Materials and Methods:** The present cross-sectional study was conducted on 30 patients of clinically diagnosed cervical cancer in the age group of 30-70 years and 30 age matched controls for the duration of two years. Serum Adenosine Deaminase and Serum Gamma Glutamyl Transferase was determined using Galanti

and Giusti Method and Carboxy substrate method respectively. Student's 't'-test was used to compare the results.

**Results:** A significant increase in adenosine deaminase and Serum Gamma Glutamyl Transferase were observed in cervical cancer patients when compared to controls with a p-value of <0.0001.

**Conclusion:** Present study conclude that serum adenosine deaminase and gamma glutamyl transferase may be used for diagnostic purposes as support parameters and may be included further for finding the prognosis. Such biochemical parameters are cheap, rapid, easy to test and can be effectively analysed even in the smaller laboratories which have not been exposed to any advanced technology.

**Keywords:** Biochemical parameters, Carcinoma cervix, Diagnostic tool.

## Exploring Pedagogical Paradigms: A Comparative Analysis of Small Group Discussion and Didactic Lectures in Biochemistry Education for First-year MBBS Students

Abstract-90

N Soumya, KN Shashidhar , K Prabhavathi  
Department of Biochemistry, Sri Devaraj Urs Medical College, Kolar, Karnataka, India.

**Introduction:** Most medical school curricula include Biochemistry as a core component. The wonderful thing about biochemistry is that it makes it much simpler to understand and consider what's happening rather than simply learning by heart what will happen when two chemicals are combined in a beaker. The majority of MBBS first-year students attempt to study biochemistry by memorisation rather than

comprehension. Students should be taught to apply and correlate their Biochemistry knowledge to the explanation of a variety of clinical situations. In order to attempt to learn outside of lecture classrooms, students should be motivated for self-directed learning. This study aims to determine if Small Group Discussions (SGD) enhance self-directed learning more than traditional lecture-style instruction.



**Aims and Objectives:** To assess the role of SGD in learning medical Biochemistry and also to determine whether conversation in small groups enhances self-directed learning more than traditional lecture classes.

**Materials and Methods:** This was an observational study conducted in our Institute over a period of three months. A total of 50 First year MBBS students involved in the SGD were selected randomly. Theory classes were conducted regularly as per schedule after one week with prior notification of topic with questions, SGD was conducted on same topic. Five groups of 10 were made and discussed the question and answers. Pretest and Post-test were conducted before and after the topic to assess their performance. At the end of class, each student fills out an anonymous feedback form. Data was analysed using student 't' test and p value was calculated.

**Results:** After the discussion, the post-test results were higher. The pupils were content at the conclusion of the class. SGD, according to students, improved their comprehension (96.3%), helped them learn on their own (90.9%), helped them perform better in the test (87%).

**Conclusion:** SGD is essential for helping pupils gain self-assurance, the capacity to study on their own, critical thinking and problem-solving abilities, understand the subject better and apply the clinical knowledge in solving patient maladies. SGD is a complete tool for effective academic performance and a collaborative, dynamic learning approach for both basic and clinical medical science.

**Keywords:** Academic performance, Clinical medical science, Self-directed learning.

# Association of Genetic and Biochemical Markers for Assessing the Risk and Severity of Coronary Artery Disease in South Indian Population

Abstract-91

**Hajra Luqman, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**M Noorjahan, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**KSS Sai Baba, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**O Sai Satish, Department of Cardiology, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**Krishna Mohan Iyapu, Department of Clinical Stem Cell Facility, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**M Vijaya Bhaskar, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**NN Sreedevi, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**Siraj Ahmed Khan, Department of Biochemistry, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**Vijay Kumar Kutala, Department of Multi-Disciplinary Research Unit, Nizam's Institute of Medical Sciences, Hyderabad, India.**

**Introduction:** Coronary Artery Disease (CAD) is a multifactorial-polygenic disorder. Apart from lipid profile and Coronary Angiography (CAG), there should be a blood biomarker that can predict early atherosclerotic changes and therefore should contribute to the primordial prevention of the disease. One such vascular-specific novel biomarker, Lipoprotein-associated Phospholipase A2 (Lp-PLA2) is expressed exclusively at the level of unstable rupture-prone atherosclerotic plaque. Genome-Wide Association studies for CAD identified the strongest signal at a Single Nucleotide Polymorphism (SNP) rs1805017 (G<A), which is a non synonymous change (H92R) located on the Exon4 of PLA2G7 gene on chromosome6 that codes for Lp-PLA2.

**Aims and Objectives:** Determine the prevalence of rs1805017 variants in CAD subgroups. Correlate genetic and biochemical parameters for assessing the risk and severity of CAD.

**Materials and Methods:** The present case-control study conducted for three years enrolled 125 volunteers (18-70 years), comprising 75 angiographically proven CAD cases and 50 age-sex and ethnically matched controls and divided them based on severity into Vessel Diseases (VD) i.e single (SVD), double (DVD), and triple (TVD). Serum Lp-PLA2 levels were estimated using ELISA. Hundred whole blood samples (75 cases and 50 controls) were analysed for DNA

sequencing using Sanger's chain termination method and grouped as Wild (GG), Heterozygous (G/A), and Homozygous (AA).

**Results:** Among CAD patients, 25% were young men (<45 years). DNA analysis revealed a prevalence of Homozygous more than Heterozygous and Wild variants. Altered (A) allelic frequency was more than wild (G) allelic frequency. Patient data obtained was compared with the control data of the 1000 Human Genome Project, inferring that the Homozygous variant has a higher risk of CAD susceptibility in other populations too. Furthermore, amongst the Homozygous cases, TVD>SVD, and among Wild cases, SVD>TVD. Lp-PLA2 levels were significantly elevated in Homozygous >Heterozygous >Wild cases. AUC of Lp-PLA2 (controls vs cases) showed excellent diagnostic ability. Multiple logistic regression after correction showed the Homozygous variant to be the only independent risk predictor of CAD.

**Conclusion:** Homozygosity of rs1805017 and elevated serum Lp-PLA2 levels were significantly associated with the severity of the disease (TVD). SNP analysis can be used as a risk stratification test for CAD development. Alternatively, as elevated Lp-PLA2 is an indicator for unstable rupture-prone plaques, it can be used as an economical, non invasive, severity predictor, especially in places where CAG is not available.

**Keywords:** Coronary angiography, Polygenic disorder, Vessel diseases.



# Association of Paraoxonase-1 Gene Polymorphism with Type 2 Diabetes Mellitus and Coronary Artery Disease in the North Indian Population

S Dhivya, Rohit Kumar, Alka Ramteke, \*Shilpa Suneja, #Charanjeet Kaur

Department of Biochemistry, VMMC and Safdarjung Hospital, New Delhi, India.

\*Assistant Professor, Department of Biochemistry, SMSR, Sharda University, Greater Noida (present).

#Senior Medical Officer, SGM Hospital, Mangolpuri, GNCT, New Delhi (present).

**Introduction:** Cardiovascular Disease (CVD) is a major cause of morbidity and mortality in Type 2 Diabetes Mellitus (T2DM) patients. Oxidative modification of Low-Density Lipoprotein Cholesterol (LDL-C) is adhered to be key for the pathogenesis of atherosclerosis, which consecutively results in Coronary Artery Disease (CAD). Paraoxonase-1(PON1) enzyme, which is associated with High-Density Cholesterol (HDL-C) in circulation, prevents the oxidation of LDL-C. Any Single Nucleotide Polymorphism (SNP) in the PON1 gene may result in lowered PON levels, resulting in increased oxidised LDL-C formation, thus increasing cardiac morbidity and mortality.

**Aim and Objective:** To check the association between PON1 L55M (rs854560) polymorphism with T2DM and CAD, the objectives were set to determine its gene frequency in T2DM with and without CAD.

**Materials and Methods:** This study was a cross-sectional study conducted over a period of one year in the Department of Biochemistry and Endocrinology, at Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India. The study

subjects (n=56) were divided into four groups: (1) Newly diagnosed T2DM; (2) T2DM on oral hypoglycaemic drugs for at least six months; (3) T2DM with CAD; and (4) Healthy controls. Thus, each group included 14 subjects. The peripheral blood was collected from the study groups after obtaining informed consent for DNA extraction and Polymerase Chain Reaction- Restriction Fragment Length Polymorphism (PCR-RFLP).

**Results:** The distribution of genotypes (AA, AT, TT) and alleles (A, T) for the PON1 L55M (rs854560) polymorphism showed no significant differences among the cases and controls.

**Conclusion:** The PON1 L55M (rs854560) polymorphism may not be associated with an increased risk of diabetes or its complications. Although this study of SNP in the PON1 gene does not prove the potential mechanism of the atheroprotective function of PON1, more extensive studies should be done to extract the correct figures and relations.

**Keywords:** Cardiovascular disease, Oxidative modification, Single nucleotide polymorphism.

# Investigating the Impact of Chemotherapy on Haematological and Biochemical Profiles among Breast Cancer Patients at a Tertiary Care Teaching Hospital

SP Tejaswi Pullakanam, Research Scholar, Department of Biochemistry, Aarupadai Veedu Medical College and Hospital, Pondicherry and Vinayaka Mission's Research Foundation (VMRF-DU) Salem.

Murugan Mannangatti, Professor, Department of Biochemistry, Aarupadai Veedu Medical College and Hospital, Pondicherry and Vinayaka Mission's Research Foundation (VMRF-DU) Salem.

Ramakrishna Nekkala, Professor and Head, Gayatri Vidya Parishad Institute of Health Care and Medical Technology, Visakhapatnam, Andhra Pradesh, India.

Ravi Shankar Bellala, Head of Clinical Oncology, Omega Hospital, Visakhapatnam, Andhra Pradesh India.

Venkata Madhavi Bellala, Professor, Department of Pathology, GITAM Institute of Medical Sciences and Research, GITAM Deemed to be University, Visakhapatnam, Andhra Pradesh, India.

**Introduction:** Anticancer agents used in chemotherapy specifically target and kill the cancer cells during the Breast Cancer (BC) treatment. However, the majority of anticancer therapies are non specific, which can harm the innate cells.

**Aims and Objectives:** To investigate the effects of chemotherapy and to evaluate the variation and importance of certain haematological,

enzymatic, and oxidative stress markers in women with BC patients undergoing chemotherapy.

**Materials and Methods:** This was a cross-sectional study conducted in our Institute over a period of three years and comprised (n=100) histopathological proven female BC at GVP Institute of health care and Medical technology and Omega Hospital. All subjects were

divided into two groups: a control group of 100 healthy females of similar age, a group of 100 patients diagnosed with BC and scheduled to start chemotherapy (treatment with anticancer agents), and recorded their demographic, clinical, and therapeutic data.

**Results:** After three courses of (AC-T) chemotherapy, a significant decrease was observed in antioxidant enzymes and the haematological profile also decreased mean intervention of (AC-T) chemotherapy. The results show that a significant decrease in the mean values of Hb, platelet count, neutrophil count, and lymphocyte count during different successive cycles of treatment (AC-T) ( $p < 0.05$ ). The results were insignificant with  $\text{Na}^+$  and  $\text{K}^+$  ion concentrations between the control and BC individuals. Hence, parameters like AST, ALT, ALP, RBS, Urea, Creatinine, and uric

acid were significant biochemical markers in BC patients. During chemotherapy, lipid peroxidation and Nitric Oxide (NO) levels were significantly increased in AC-T-treated BC patients than in controls.

**Conclusion:** Chemotherapy causes a certain amount of systemic oxidative stress, which persists during subsequent clinical interventions and may influence the patients and clinical outcomes. Chemotherapy produced significant adverse effects such as anaemia, neutropenia, leukopenia, thrombocytopenia, and hepatic dysfunction as a side-effect of treatment due to disturbed and lowered levels of haematological parameters.

**Keywords:** Anticancer agents, Haematological parameters, Systemic oxidative stress.

## Exploring Vitamin D and Vitamin B12 Status in the Patients with Hypothyroidism

Abstract-94

**Surbhi Tyagi, Research Scholar, Department of Biochemistry, Gautam Buddha Chikitsa Mahavidyalya, Dehradun.**  
**Suryakant Nagtilak, Professor, Department of Biochemistry, Gautam Buddha Chikitsa Mahavidyalya, Dehradun.**

**Introduction:** Researcher interest in the relationship between vitamins and thyroid problems has long existed. There are a few studies in the literature that evaluate specific parameters like vitamin B12 levels and thyroid profiles, but hardly any of them examine the correlation of vitamin D and vitamin B12 levels with hypothyroidism in the western Uttar Pradesh, India.

**Aims and Objectives:** To investigate the vitamin D and vitamin B12 levels in patients with hypothyroidism.

**Material and Methods:** This study was cross-sectional study conducted over a period of three months in the Department of Biochemistry, Subharti Medical College, Meerut, Uttar Pradesh, India, after obtaining Ethical clearance by the Institutional Ethical Committee. A total of 200 patients aged between 18 and 65 years; freshly diagnosed with hypothyroidism (both sexes) in the OPD (Outpatient department) and IPD (inpatient department) of Medicine Department, Chhatrapati Shivaji Subharti (C.S.S) Hospital; with no history of intake of thyroxine and hypolipidaemic drugs in the last three months were enrolled for the present study. Estimation of Thyroid profile, vitamin D and vitamin B12 levels were done by

automated Chemiluminescence immunoassay technique using Siemens Advia centaur XP system.

**Results:** Vitamin D and Vitamin B12 levels were found to be significantly lower in the patients with hypothyroidism. Their levels were insignificantly lower in the females than male patients.

**Conclusion:** Present study findings highlight the importance of comprehensive assessments of vitamin B12 levels in patients with thyroid problems, which makes them especially valuable in clinical settings. As soon as hypothyroidism is detected, the levels of vitamin B12 should be examined. This should be done annually and as soon as possible. A yearly evaluation is required. Additionally, according to present study findings, Hypovitaminosis D was present in patients with hypothyroidism, and this condition is strongly correlated with the degree and severity of the hypothyroidism. This supports the wisdom of vitamin D supplementation and suggests that all hypothyroid individuals be screened for vitamin D deficiency.

**Keywords:** Hypovitaminosis D, Thyroid profiles, Vitamin D supplementation.

# Effect of Cigarette Smoking on Liver Functions: A Comparative Study Conducted among Smokers and Non Smokers Male in Dehradun, Uttarakhand, India

Abstract-95

**Jyoti Sharma, PhD Scholar, Department of Biochemistry, Ras Bihari Bose Subharti University, City Dehradun, Uttarakhand, India.**

**Introduction:** Smoking may affect the liver through inflammatory pathways and may aggravate the pathogenesis effect of alcohol on the liver. Tobacco use is widely spread throughout the world. The effect of smoking on human health are serious and, in many cases, deadly.

**Aims and Objectives:** To estimate the level of serum liver enzymes in smokers and healthy controls.

**Materials and Methods:** The present study was a case-control study conducted over a period of one year to investigate the effect of cigarette smoking on some liver functions in male population in Dehradun city. The study was carried out on 30 male smokers, who smoked at least 12 cigarettes per day for at least 15 years. The group includes smokers with age range between 35-55 years. Non smokers, (control, n=30) group were collected with the same range of age for statistical comparison. The whole blood samples were drawn by venipuncture from each member and liver functions test were estimated by a kit method on automatic analyser.

**Result:** The results of the study revealed a significant increase of Malondialdehyde (MDA), which is an indicator of lipid peroxidation and oxidative stress significantly increased in cigarette smokers in groups when compared with control group. While the plasma level of total protein, albumin and total bilirubin decreased during smoking. Cigarette smoking raised Alkaline Phosphatase (ALP), Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), plasma total cholesterol and triglycerides in smoker group when compared with non smoker group.

**Conclusion:** Cigarette smoking leads to oxidative stress by free radical generation by the mechanism of lipid peroxidation. Smoking exerts negative influence on liver functions test should be carefully interpreted, and further study on the mechanism of the effects is warranted.

**Keywords:** Alanine aminotransferase, Aspartate aminotransferase, Inflammatory pathways.

# Biochemical Markers of Bone Metabolism in Hyperthyroidism Patients

Abstract-96

**T Ilanchezian, Department of Biochemistry, Vinayaka Mission Medical College, Karaikal.  
Dr. Lakshmi Prabha, Department of Biochemistry, Vinayaka Mission Medical College, Karaikal.  
Dr. Aarti Karnik, Department of Biochemistry, ACPM Medical College, Dhule – Maharashtra, India.**

**Introduction:** Hyperthyroidism is a pathological disorder in which excess thyroid hormone is synthesised and secreted by the thyroid gland. Elevated thyroid hormones directly stimulate bone cells and accelerate bone turnover. The effect of excess thyroid hormone on the serum Osteocalcin (OSC), alkaline phosphatase, calcium and phosphorus levels are analysed in newly diagnosed hyperthyroidism patients.

**Aims and Objectives:** To investigate the influence of hyperthyroidism on biochemical markers of bone metabolism in order to create awareness on risk of development of bone disease in hyperthyroidism.

**Materials and Methods:** The study was case-control study conducted over a period of eight months at the ACPM Medical College and Hospital, Dhule, Maharashtra, India. Newly diagnosed 50 patients with hyperthyroidism and 30 age and sex matched healthy controls were included in the study. Thyroid profile including

Thyroid Stimulating Hormone (TSH), Total tri-iodothyronine (T3) and Total tetra-iodothyronine (T4) levels, and biochemical markers of bone metabolism-serum OSC, Alkaline Phosphatase (ALP), calcium and phosphorus were analysed.

**Result:** In hyperthyroidism patients, the serum FT3, FT4 and TSH levels were significantly elevated (p-value=0.001), compared to the control group. Significant difference was observed in serum OSC and ALP levels (p-value=0.001).

**Conclusion:** Association of elevated OSC, ALP and calcium levels with elevated levels of thyroid hormones in hyperthyroid patients indicates that hyperthyroidism influences the bone mineral homeostasis. OSC serves as a better biomarker than the ALP in the risk assessment of bone loss in newly diagnosed hyperthyroidism patients.

**Keywords:** Alkaline phosphatase, Osteocalcin, Risk assessment.

# A Study of Relationship between Serum Lipids and Sensorineural Hearing Loss

Savi Dutta, Busi Karunanand, Sanjiv Kumar Bansal

PhD Scholar, Department of Biochemistry, SGT Medical College, Hospital and Research Institute, Gurugram, Haryana, India.

**Introduction:** Sedentary lifestyle which is a very common thing now-a-days results to cause new challenges on the normal physiological mechanisms of the human body. Passive living, alcohol dependency, smoking habits, nicotine dependency may induce risk of developing certain diseases, particularly in elderly.

**Aims and Objectives:** To scrutinize the relationship between degree of Sensorineural Hearing Loss (SNHL) and serum lipid level (total cholesterol, triglyceride, low density lipoproteins, high density lipoproteins). To assess the changes in specific biochemical parameters in these patients and compare it with severity of SNHL.

**Materials and Methods:** A cross-sectional study was conducted for two years duration on 70 patients between 30 to 60 years

diagnosed with SNHL at ENT outpatient department in SGT Hospital, Gurugram, India.

**Results:** Elevated serum levels of total cholesterol in males and females, along with triglyceride levels in males, are significantly correlated with the severity of SNHL. Conversely, there is no observed direct correlation with high-density lipoprotein and low-density lipoprotein levels for both genders. The presence of a hyperlipidaemia state constitutes a major menace for individuals suffering from SNHL.

**Conclusion:** Regular screening and systematic monitoring of serum lipid levels could prevent the progression of severe SNHL, leading to an enduring enhancement in the quality of life.

**Keywords:** Lipid parameters, Quality of life, Sedentary lifestyle.

# Correlation of Urinary Nephryn with Microalbumin to Predict Early Onset of Nephropathy in Patients with Type 2 Diabetes Mellitus

Vemugadda Harika, Saveetha Institute of Medical and Technical Sciences, Tamil Nadu, India.

Veluri Ganesh, ESIC Medical College and Hospital, Kalaburaga, Karnataka, India.

**Introduction:** Nephropathy is most common microvascular complication in patients with Type 2 Diabetes Mellitus (T2DM). Progressive damage and impaired functions of podocytes often occur in the early stages of nephropathy. Thus, nephryn is a podocyte protein may be served as a potential biomarker for to detect early onset of Diabetic Nephropathy (DN).

**Aims and Objectives:** The present study was carried out to investigate the correlation Urinary Nephryn with Microalbumin to predict early onset of nephropathy in Patients with Type 2 Diabetes Mellitus. To measure biochemical and clinical parameters in T2DM patients with normo, micro and macroalbuminuria and compare them with age, gender and BMI matched controls. To measure urinary nephryn levels in T2DM patients with normo, micro and macroalbuminuria and compare them with age, gender and BMI matched controls. To study the correlation between urinary nephryn with microalbumin and eGFR for early detection of nephropathy in patients with T2DM. To construct the receiver operating character between urinary nephryn, microalbumin and eGFR to identify sensitivity and specificity to predict early onset of nephropathy.

**Materials and Methods:** This was a case-control study conducted over a period of three years. A total of 200 T2DM patients were

included into the study. The patients subdivided into three groups (50 T2DM with normoalbuminuria, 50 microalbuminuria and 50 macroalbuminuria) based on microalbumin levels and also included 50 age and gender matched healthy individuals were considered as controls. Biochemical parameters was analysed by laboratory standard methods, microalbumin levels by immuno turbidimetric method and urinary nephryn was determined by ELISA method.

**Results:** Urinary nephryn levels were significantly increased in all the groups of T2DM patients than controls ( $p=0.001$ ). There was a strong positive correlation between urinary nephryn and microalbumin. The urinary nephryn showed a strong negative correlation with eGFR. These levels were positively correlated with microalbumin and negatively correlated with eGFR. The ROC analysis showed that nephryn has a highest predicted probability of 97% than microalbumin 54%, respectively  $p$ -value was  $<0.001$ .

**Conclusion:** Present study documented significant amount of nephrynuria in all the groups of T2DM patients when compared to controls. The urinary nephryn may be considered as an early predictable sensitive and specific marker for nephropathy in patients with T2DM.

**Keywords:** Biomarker, Microvascular complication, Podocyte protein.

# Incidental Diagnosis of Acquired Erythrocytosis in a Patient with AGE: A Case Report with Negative JAK 2 V617F/exon 12 Mutation

Abstract-99

**N Ilavenil, R Panimathi, G Udayakumari, C Archanadevi, J Vinodha, P Deepalakshmi**  
Department of Biochemistry, Government Kilpauk Medical College, Tamil Nadu, India.

**Introduction:** Erythrocytosis is frequently encountered as an incidental finding on laboratory testing with elevated haematocrit levels.

**Case Report:** A 49-year-old male with a history of alcoholism and smoking presented with fever, loose stools and vomiting in the outpatient department. Post-gastroenteritis, abdominal examination revealed tenderness and ultrasound showed mild hepatomegaly. Blood tests showed elevated Red Blood Cells (RBCs) count, Haemoglobin and haematocrit, with subnormal serum erythropoietin levels. Despite a negative PV JAK2 reflex panel, indicative of non Polycythemia Vera erythrocytosis, the patient had a strong smoking history, suggesting Acquired Erythrocytosis secondary to smoking.

**Discussion:** In this case, the absence of JAK2 gene mutations excluded PV, directing attention to smoking as the likely cause of secondary erythrocytosis. Regular Complete Blood Count (CBC) follow-ups and emphasising smoking cessation were recommended. Advances in JAK2 gene understanding have streamlined erythrocytosis diagnosis, expanding recognition of non PV causes.

**Conclusion:** Non haematological origins underlie nearly half of erythrocytosis cases. In this instance, smoking-induced secondary erythrocytosis heightened cardiovascular risks. Patient education on the dangers of smoking and the benefits of cessation is vital for managing erythrocytosis and mitigating associated health hazards.

**Keywords:** Haematocrit, Haemoglobin, Hepatomegaly.

# Malignant Melanoma with Gastric Metastasis: Case Report of a Rare Phenomenon

Abstract-100

**V Vijayabanu, Department of Biochemistry, Government Kilpauk Medical College, Chennai, Tamil Nadu, India.**  
**R Panimathi, Department of Biochemistry, Government Kilpauk Medical College, Chennai, Tamil Nadu, India.**  
**S Umamaheswaran, Department of Surgical Gastroenterology, Government Kilpauk Medical College, Chennai, Tamil Nadu, India.**

**Introduction:** Malignant Melanoma (MM) with gastric metastasis is extremely rare. Authors report a case of gastric metastasis caused by MM of upper limb.

**Case Report:** A 45-year-old male was hospitalised for abdominal pain and melena on and off for two years for which no treatment was taken. Patient had melanotic lesion left thumb in 2019. Left thumb amputation with Axillary lymph node dissection done. Excision biopsy was consistent with MM. Further evaluation of patient was done to rule out metastasis. Upper GI endoscopy picked up lesions in anterior wall of stomach and biopsy showed atypical cells with extensive melanin pigments. Patient underwent total gastrectomy. Gene sequencing done by Sanger's method with extracted DNA

from the gastrectomy specimen. Mutations were found in BRAF gene at V600K.

**Discussion:** Of all the mutations identified in MM, BRAF mutations are >50% of cases. Most of which being BRAF V600E mutations, the incidence of BRAF V600K is 10-30%. BRAF V600K MM have a higher risk of developing metastases compared to BRAF V600E MM.

**Conclusion:** MM gastric metastasis is extremely rare, but when MM is diagnosed, endoscopic screening should be done without fail. Early diagnosis and treatment is warranted for better prognosis of patients with MM.

**Keywords:** Abdominal pain, Gene sequencing, Sanger's method.



# Effects of Storage on Serum Biochemical Parameters

Abstract-101

**CE Lakshaniya, KN Pujari, Abhaykumar Sardeshmukh**  
Department of Biochemistry, GMCH Miraj, Maharashtra, India.

**Introduction:** Storage of serum sample for longer duration may lead to variations in biochemical parameters causing erroneous results.

**Aims and Objectives:** This study was outlined to evaluate the effects of storage on 10 different serum biochemical parameters.

**Materials and methods:** This was a cross-sectional observational study with a study duration of three months. Fasting blood samples from 45 healthy volunteers (25 to 40 years of age), free from any medications were collected with their consent excluding the antenatal mothers. Analysis was performed on the separated sera for 10 analytes without any delay (zero time) using ERBA fully autoanalyser and Sodium and Potassium by Electrolyte analyser.

Furthermore, each sample was stored in the refrigerator at 20°C and assays were analysed at 24 hours, 3<sup>rd</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21 stand 30<sup>th</sup> day after sample collection.

**Results:** Glucose, AST, ALT, Creatinine and Potassium levels showed statistically significant variation over time. There was decrease in glucose concentration (18.3%) while increase was observed in AST (52%), and ALT (10.8%), Creatinine (70.97%) potassium (52%) on day 3 which has showed more variations on prolonged storage.

**Conclusion:** The samples should be assessed immediately when received, to avoid errors in the results which may lead to incorrect clinical decisions and fallacious management of the patient.

**Keywords:** Biochemical parameters, Errors, Fallacious.

# Frequency of Preanalytical Errors in Arterial Blood Gas Analysis in a Tertiary Care Centre

Abstract-102

**Dr. K Rajesh, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Dr. MP Saravanan, Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Dr. R Gayathri, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Arterial Blood Gas (ABG) test is one of the most common tests performed on patients in Intensive Care Units (ICU) which measures the blood gas determining the partial pressures of the physiologically active gases in blood (pO<sub>2</sub>, pCO<sub>2</sub>), the blood pH, and the oxygen saturation of haemoglobin (SaO<sub>2</sub>). Most errors occur during the preanalytical phase.

**Aim and objectives:** To evaluate the frequencies of errors in preanalytical phase ABG analysis in a medical laboratory of a tertiary care hospital.

**Materials and Methods:** In this retrospective study conducted for one year, frequency and type of preanalytical errors observed by screening all samples received from Tamil Nadu Accident and Emergency Care Initiative (TAEI) ward and ICU over three months period were collected by lab staff before the analytical phase was undertaken in clinical biochemistry laboratory. Data analysis was done on 1,438 arterial blood samples collected and tested.

**Results:** On receiving 1,438 tubes during the data collection period of three months, 73 samples were found to be rejected for the following reasons: preanalytical errors identified and analysed were improper mixing 7.8%, inappropriate heparinisation 2.52%, inadequate sample volume 4.72%, mislabelled sample 2.22%, improper transport (without using icepacks) 20.3%, improper transport (immersion of samples in icepack) 3.8%, delayed transport 12%, broken tube 0.28%, bending the syringe needles 18%, air entrapment 28.3%.

**Conclusion:** Considering the preanalytical errors discussed, one can prevent such errors in future for the betterment of patient care and in gaining the trust in accuracy of laboratory investigations for diagnosis.

**Keywords:** Blood gas, Inappropriate heparinisation, Intensive care units.

# Vitamin D Deficiency and its Association with Thyroid Disease

Abstract-103

**Adeeba Afsheen, Bhanuja Rani**  
Department of Biochemistry, Osmania Medical College, Hyderabad, India.

**Introduction:** Vitamin D deficiency is a global health problem, its role as an immune modulator has been recently emphasised. It has been shown to be associated with autoimmune diseases, including Rheumatoid Arthritis (RA), Systemic Lupus Erythematosus (SLE), Inflammatory Bowel Disease (IBD), Multiple Sclerosis (MS), Type 1 Diabetes Mellitus (T1DM) and that vitamin D supplementation prevents the onset and/or development of these autoimmune diseases. Exposure to UV B light (290–320 nm) are the main source of vitamin D. Serum 25(OH) D, is the most abundant circulating precursor of active vitamin D and is a good measure of vitamin D status in the body.

**Aims and objectives:** To examine the relationship between hypothyroidism and vitamin D deficiency and to find out relation between serum calcium levels with hypothyroid disease.

**Materials and methods:** This was a case-control study conducted in the Department of Biochemistry with study duration of six months. Subjects-Group I "control group": included 30 apparently healthy individuals without any chronic illness, Group II "Hypothyroid patients": It included 30 patients [12 Male and 18 Female], their mean ages  $\pm$  S.D 46.66 $\pm$ 5.22 years. Serum samples received by biochemistry department, in Osmania general hospital were analysed. Serum TSH and vit D levels were analysed by advia centaur XPT system and serum ca levels analysed by Beckman coulter.

**Results:** By using t-test to compare between the two groups, serum 25(OH) vit D level was significantly lower in hypothyroid patients than in controls (p-value <0.00001). Serum calcium levels recorded a significant difference between the studied groups (p-value <0.00001) significant positive correlations were recorded between serum 25 (OH) vit D and each of serum calcium levels (r-value=0.751, p-value <0.05), T3 (r-value=0.587, p-value <0.05). On the other hand, there were significant negative correlations between serum 25 (OH) vit D and TSH (r-value=-0.586, p-value <0.05). Serum calcium levels had a negative significant correlation with serum TSH (r-value=-0.40, p-value=0.029). Otherwise it was non-significantly correlated with either T3 and T4. There were significant positive correlations between serum 25 (OH) vit D and each of serum calcium levels (r-value=0.477, p-value=0.008).

**Conclusion:** Present results showed that patients with hypothyroidism suffered from hypovitaminosis D with hypocalcemia. Moreover, from the above results it is suggested that deficiency of serum vit D and calcium levels were significantly associated with degree and severity of the hypothyroidism which encourage the advisability of vit D supplementation. Screening for Vitamin D deficiency and serum calcium levels is recommended for all hypothyroid patients.

**Keywords:** Hypocalcemia, Hypothyroid, Hypovitaminosis D.

# A Comparative Estimation of Glycated Haemoglobin by Enzymatic Method vs High Performance Liquid Chromatography

Abstract-104

**Patan Rashiya Khanum, Final Year Postgraduate, Department of Biochemistry, OMC, Hyderabad, Telangana, India.**  
**Bhanuja Rani, Associate Professor, Department of Biochemistry, OMC, Hyderabad, Telangana, India.**

**Introduction:** HbA1c result provides information on metabolic control in Diabetes Mellitus (DM) and could also be used for its diagnosis. There are different methods of estimating HbA1c. This study compares estimation of HbA1c by High Performance Liquid Chromatography (HPLC) versus enzymatic method.

**Aims and Objectives:** 1] To estimate the HbA1c values in blood samples collected from study subjects by HPLC and enzymatic methods, 2] To observe the correlation of HbA1c values in these two different methods.

**Materials and Methods:** This was an observational study conducted in the Department of Biochemistry, study duration was of three months. Blood samples were collected from 70 study subjects including prediabetics and diabetics using K2 EDTA vacutainers and HbA1c levels were measured by Ion Exchange HPLC using Bio-Rad D-10 dual program and Enzymatic method process using ARCHITECT C4000 (ABBOTT).

**Results:** The paired t-test showed p-value 0.330 suggesting a non significant very small difference between two methods. The correlation between the HbA1c values measured by two different methods showed strong positive correlation with r-value 0.966 and p-value <0.001.

**Conclusion:** This study results showed that estimation of HbA1c by HPLC and enzymatic method has low variability and strong correlation. Enzymatic HbA1c assay has all the advantages of the HPLC method in areas of accuracy, precision. Moreover, enzymatic method is cost effective, simpler, applicable to chemistry analysers and has less interferences. So it is recommended to conduct further studies with higher sample size and other routine methods to facilitate patient follow-up and treatment.

**Keywords:** Enzymatic assay, Diabetes mellitus, Ion exchange.

# Dyslipidaemia and the Progression of Renal Disease in Hypertensive Patients

Abstract-105

Kanchan Chauhan, Postgraduate Student, Department of Biochemistry, Subharti Medical College, Meerut, Uttar Pradesh, India.

**Introduction:** Due to the continuous changes in living standards and dietary habits, the incidence of dyslipidaemia and hypertension has increased annually. Dyslipidaemia includes hypertriglyceridaemia, hypercholesterolaemia, lower high-density lipoproteinaemia, and mixed hyperlipidaemia, while hypertension is defined as systolic blood pressure  $\geq 140$  mm Hg and diastolic blood pressure  $\geq 90$  mmHg. Hypertension is one of the main co-morbidities associated with dyslipidaemia. Prevalence of hypertension are associated with increase in blood lipid, abnormal lipids in blood lead to the accumulation of lipids, in almost all cell types. High cholesterol causes macrophage infiltration and foam cell formation in the kidney.

**Aims and Objectives:** The present study was done to find out the association of dyslipidaemia and hypertension and their effect on the progression of renal disease.

**Materials and Methods:** This was a hospital based case-control study conducted over a period of six months. Twenty obese individuals with dyslipidaemia and hypertension attending medicine Outpatient Department (OPD) and giving informed consent, were included in study group while 20 age and sex matched healthy individuals were taken as control.

**Results:** Present study found that Triglycerides (TGs), and high levels of Total Cholesterol (TC) and Low-Density Lipoprotein (LDL) with increase blood pressure are associated with decreased renal function.

**Conclusion:** Elevated TG, TC, and LDL and hypertension might contribute to reduced renal function. Monitoring and management of blood lipids on a regular basis should be considered.

**Keywords:** Hypercholesterolaemia, Hypertension, Hypertriglyceridaemia.

# Triglyceride Glucose Index an Unveiler of Insulin Resistance in Hypothyroid Patients?

Abstract-106

Salen Blessy Paulian, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.

MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.

S Aruna Devi, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.

**Introduction:** Thyroid dysfunction is associated with abnormal glucose-insulin homeostasis and the Triglyceride Glucose index (TyG) has been recommended as a surrogate marker of Insulin Resistance (IR). As long as the pancreas functioning is normal blood glucose can be normal in non diabetic hypothyroid patients but chronic IR can lead to prediabetes and diabetes and increase the risk of cardiovascular disease and stroke. So it is important to predict the IR at the earliest.

**Aims and Objectives:** To evaluate the frequency of raised TyG index among diabetic and non diabetic hypothyroid patients.

**Materials and methods:** In this cross-sectional study conducted for the duration of six months, TyG index was calculated from the samples obtained from 30 non diabetic hypothyroid and 30 diabetic hypothyroid patients attending routine master health check-up. The cut-off value of TyG index for IR was taken as 4.65 as per the study in south Indian population.

**Results:** The mean value of Thyroid Stimulating Hormone (TSH) in non diabetic and diabetic hypothyroid was 13.38 and 20.80 respectively. The mean value of TyG index in non diabetic and diabetic hypothyroid was 4.59 and 4.97 respectively. The frequency of raised TyG index in non diabetic hypothyroid was 50% and in diabetic hypothyroid was 86.7%.

**Conclusion:** Considering the frequency of raised TyG index in 50% of non diabetic hypothyroid patients, TyG index can be used as a simple screening tool from the routine blood tests for the early prediction of IR in hypothyroid patients and appropriate preventive management can be done which can reduce the morbidity.

**Keywords:** Glucose-insulin homeostasis Thyroid dysfunction, Triglyceride glucose index.

# Reliability of Blood Gas Analyser for Electrolytes: A Comparative Study

Abstract-107

**M Renuga Devi, Postgraduate, Department of Biochemistry, Government Stanley Medical College and Hospital, Chennai, India.**

**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College and Hospital, Chennai, India.**

**B Shobana, Assistant Professor, Department of Biochemistry, Government Stanley Medical College and Hospital, Chennai, India.**

**Introduction:** Electrolyte abnormalities are one of the commonest causes of morbidity and mortality. So, the Turn Around Time (TAT) for reporting should be as low as possible. Commonly it is measured in serum using electrolyte analyser which takes 30-40 minutes in our hospital. Point of care analysers for Arterial Blood Gas (ABG) gives report within five minutes. This study was done to know whether we can consider this point of care analyser values for electrolytes.

**Aims and Objectives:** To compare the values of Sodium and Potassium measured in Venous sample using Electrolyte Analyser and Arterial sample using Blood Gas Analyser.

**Material and methods:** In this observational study conducted for two months, sodium and potassium values in arterial and venous samples were compared using mean and p-value in 40 patient samples who are admitted in Government Stanley Medical College and Hospital, Chennai, India. Arterial and venous samples for electrolytes were taken simultaneously or not more than one hour apart and analysis done after QC passed in sensacore ABG analyser and sensacore electrolyte analyser.

**Results:** The mean value of arterial and venous sodium was  $145.4 \pm 7.67$  mmol/L and  $138 \pm 7.08$  mmol/L respectively and the mean difference was 7.43 (p-value <0.001) higher in the arterial sample. The mean value of arterial and venous potassium was  $3.77 \pm 0.82$  mmol/L and  $4.16 \pm 0.99$  mmol/L respectively and the mean difference was 0.39 (p-value=0.002) higher in the venous sample.

**Conclusion:** The United States Clinical Laboratory Improvement Amendments (CLIA) accepts 0.5 mmol/L difference in measured potassium levels and 4 mmol/L difference in measured sodium levels. Since potassium values lies within the CLIA accepted range of within 0.5 mmol/L we can use potassium values taken in ABG and Electrolyte Analyser interchangeably, while the same cannot be concluded for the measurement of sodium, because of the significant difference in sodium measurement by the two instruments.

**Keywords:** Electrolyte abnormalities, Turn around time, United States clinical laboratory improvement amendments.

# Bilirubin Interference in Creatinine Estimation by Jaffe Kinetic Method and Overcome by NaOH and Dilution Method

Abstract-108

**S Ragasudha, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**MP Saravanan, Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**J Rathi Roopavathy, Tutor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Creatinine measurement in icteric sample is a major but unresolved problem. Icterus is one of the most frequent endogenous interferences in clinical laboratories. Bilirubin causes negative interference in creatinine measurement using general techniques.

**Aims and Objectives:** To evaluate the bilirubin interference in creatinine measurement by Jaffe Kinetic method and to compare the corrective action done by 2N NaOH method and dilution method.

**Materials and methods:** In this cross-sectional study conducted for five months, evaluation of bilirubin >5 mg/dL concentration interference in creatinine measurement by Jaffe kinetic method was done. This study was done on 70 blood samples which were received in Clinical Biochemistry laboratory. Both bilirubin and creatinine concentration in serum samples were measured by Walter and Gerarde and Jaffe Kinetic method respectively using

autoanalyser. After baseline value of creatinine, same samples were measured by 2N NaOH method and dilution (1 in 5) method.

**Results:** The results showed differences in creatinine value with respect to methods and extent of bilirubin concentration. It was found that the creatinine obtained by 2N NaOH and dilution method had greater value than baseline creatinine. The significant interference was seen in the sample with bilirubin concentration greater than 20 mg/dL i.e p-value <0.05 at 95% confidence level.

**Conclusion:** This shows that the bilirubin has negative interference in creatinine value measurement by Jaffe kinetic method and interference increases with higher concentration of bilirubin in blood sample. It can overcome by 2N NaOH method and dilution method. Creatinine acts as an indicator for renal function. Hence care should be taken before creatinine measurement in icteric sample >5 mg/dL.

**Keywords:** Icterus, Jaffe kinetic method, Renal function.



# A Comparative Study of Biochemical Markers of Myopathy in Hypothyroid and Euthyroid Females attending Tertiary Care Hospital in North Chennai, India

**S Suganya, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**B Sudha Presanna, Associate Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Sudharani Michael, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Hypothyroidism is one of the commonly occurring thyroid disorders worldwide. Prevalence of hypothyroidism is around 4-10% in India. Thyroid hormone exerts its action in all tissues and modulates several activity. Alteration in thyroid levels has a profound effect on skeletal muscle. Muscle involvement in hypothyroidism is common with 30-80% of patients. Muscular symptoms varying from myalgia to true myopathy.

**Aims and Objectives:** To find out the correlation between biochemical markers of myopathy and thyroid hormones among hypothyroid patients. To compare it with normal healthy controls.

**Materials and methods:** A case-control study was conducted for the duration of one year among 30 newly diagnosed hypothyroid females (25-55 years) attending Endocrinology OPD and 30 normal healthy females (25-55 years) attending routine health check-up at Government Stanley Hospital for a period of 15 days. Thyroid function tests (TSH, fT4), Serum CK-Total, CK - MB and LDH activities were measured and compared among the two groups. Patients with any

known muscular disorders, cardiovascular diseases, autoimmune diseases, taking drugs like statins, antiarrhythmic drugs, steroids, Non Steroidal Anti-Inflammatory Drugs (NSAIDs), recent history of intramuscular injections, strenuous activity were ruled out.

**Results:** The mean values of TSH, Creatine kinase (CK- Total) ( $229 \pm 88.10$  U/L), Lactate dehydrogenase ( $471 \pm 98.5$  U/L) were significantly increased in patients with hypothyroidism while CK-MB ( $18 \pm 6.7$  IU/L) was statistically insignificant when compared with the controls. Significant positive correlation of CK, LDH, CK-MB observed with TSH and fT4 levels ( $p$ -value  $< 0.0001$ ).

**Conclusion:** There was a significant elevation in CK (Total) and LDH activities indicate muscle involvement in hypothyroidism, which indicates these parameters can be used for screening myopathy in hypothyroidism and monitor the outcome of hormone replacement therapy.

**Keywords:** Hormone replacement therapy, Lactate dehydrogenase, Thyroid hormone.

# Study of Serum Neopterin and CRP Level in Patient with Fluorosis in Endemic Region

**Dr. Onesh Ch Marak, Resident, Department of Biochemistry, MGM Medical College, Indore (M.P), India.**  
**Dr. PD Sarkar, Head, Department of Biochemistry, MGM Medical College, Indore (M.P), India.**  
**Dr. Rajeev Lohokare, Associate Professor, Department of Biochemistry, MGM Medical College, Indore (M.P), India.**  
**Dr. Vandana Varma, Associate Professor, Department of Biochemistry, MGM Medical College, Indore (M.P), India.**

**Introduction:** Fluoride is the 13<sup>th</sup> most abundant element. It is estimated that 25 million people in India alone are victim of fluorosis. In Dhar (Madhya Pradesh) ingestion of excessive fluoride in drinking water is close to 50% villages. Systemic inflammation may play a role in pathogenesis of fluorosis

**Aims and Objectives:** To estimate and determine the Serum Neopterin and C-reactive Protein (CRP) in patient with fluorosis in endemic region and to assess correlation if any between them.

**Materials and Methods:** A cross-sectional study was conducted for the duration of one year by MGMMC Indore in collaboration with Bhoj District Hospital Dhar, Madhya Pradesh, India. The study consisted of 70 patients as cases and control each between age

group of 1 to 7 years. Five mL venous blood sample was collected and estimated for serum neopterin, CRP and urine fluoride by Enzyme Immunoassay (ELISA), immunoturbidimetric and ion selective electrode respectively. Statistical analysis was performed using EPI INFO.

**Results:** The level of serum neopterin and CRP was found to be increased in patients with fluorosis (mean serum neopterin 2.45 ng/mL and mean serum CRP 3.29 ng/dL and mean urine fluoride is 1.95 ppm), ( $p$ -value  $< 0.01$ ) and there was a strong positive correlation ( $p$ -value  $< 0.001$ ) between serum neopterin and CRP ( $r$ -value is 0.70), neopterin and fluoride is ( $r$ -value is 0.65), CRP and fluoride ( $r$ -value is 0.65).



**Conclusion:** As per the results of this study, there was a significant association between Neopterin, CRP and fluoride in fluorosis subjects. Plasma neopterin and CRP levels were significantly higher among patient with endemic fluorosis when compare with control

group. Further multicentric studies are required to prove the possible relationship and to gain a better understanding the role of Neopterin level in fluorosis.

**Keywords:** C-reactive protein, Fluoride, Systemic inflammation.

## Alkaptonuria: A Case Report

Abstract-111

**N Sabina Lois, Department of Biochemistry, PSG Institute of Medical Sciences and Research, Tamil Nadu, India.**  
**V Aruna, Department of Biochemistry, PSG Institute of Medical Sciences and Research, Tamil Nadu, India.**  
**K Kamalanathan, Department of Orthopaedics, PSG Institute of Medical Sciences and Research, Tamil Nadu, India.**  
**M Mohan Prasad, Department of Orthopaedics, PSG Institute of Medical Sciences and Research, Tamil Nadu, India.**  
**Yee Tun Oo, Department of Orthopaedics, PSG Institute of Medical Sciences and Research, Tamil Nadu, India.**

**Introduction:** Alkaptonuria (AKU) is a rare metabolic disorder with autosomal recessive inheritance and a distinctive triad of homogentisic aciduria, Ochronosis, and arthritis.

**Case Report:** A 58-year-old male presented to the Orthopaedic OPD with chief complaints of severe pain in the Right hip and pain of Left Shoulder. He gave history of his urine turning black on exposure to sunlight since childhood. His past medical and surgical history revealed multiple fractures and orthopaedic interventions. On admission he was diagnosed as Osteoarthritis of Right Hip and Left Shoulder. Clinical examination revealed bluish-black discoloration of ear lobes and sclera. Biochemical tests done; Urine turned black on exposure to atmospheric air for a few minutes. Urine Benedict's test- Positive; Ammoniacal silver nitrate test – Positive. He underwent Total Right Hip Replacement on 26-09-2023 and discharged in a stable condition.

**Discussion:** Alkaptonuria occurs due to mutation in HGD (homogentisate 1,2 dioxygenase) gene mapped to chromosome 3q13.33. So HGD cannot form 4-maleylacetoacetate from homogentisic acid leading to accumulation of homogentisic acid. HGD converts to benzoquinone acetic acid, which produces polymers similar to melanin accumulating in collagen known as ochronosis. Ochronotic deposits bind to connective tissues leading to arthritis, renal and prostatic calculi, cholelithiasis, ruptures of muscle, tendons, and ligaments.

**Conclusion:** If arthritic complications could be prevented, a significant clinical burden of the disorder would be eliminated. Prioritising a multidisciplinary approach to enhance the quality of life and minimise morbidity is crucial in treating AKU patients.

**Keywords:** Arthritis, Homogentisic aciduria, Ochronosis.

## Association of Hyperuricemia with Type 2 Diabetes Mellitus

Abstract-112

**K Pramila, MV Preethi, J Yuvasri**  
**Professor, Institute of Child Health and Hospital for Children, Institute of Biochemistry, Madras Medical College, Chennai; Assistant Professor, Postgraduate, Institute of Biochemistry, Madras Medical College, Chennai, India.**

**Introduction:** Uric acid is a powerful free radical scavenger in humans, but hyperuricemia may induce insulin resistance and beta cell dysfunction.

**Aims and Objectives:** To determine the association of hyperuricemia in Diabetes mellitus. To compare and correlate the association of hyperuricemia in Diabetes Mellitus and prediabetic group.

**Materials and Methods:** A population-based cross-sectional study was conducted for the duration of six months which recruited 150 adults aged 25 to 60 years to collect data on socio-economic status, lifestyle factors, and clinical patterns. A total of 150 patients with known diabetes mellitus was selected at OPD and blood samples were collected and Serum Uric acid levels was checked in Laboratory. 75 Healthy people with normal glycaemic control samples were collected additionally. Association between

hyperuricemia and hyperglycemia (isolated impaired fasting glucose (IFG), isolated impaired glucose tolerance (IGT), combined IFG-IGT, and type 2 diabetes (T2D)) were evaluated by multinomial logistic regression analysis in, adjusting for the confounding factors including socio-economic status, lifestyle factors, and clinical measures.

**Results:** Uric acid values were much higher in IFG, IFG-IGT, and T2D groups compared to those in the normal glucose tolerance (NGT) group.

**Conclusion:** The study showed that there was a significant association of hyperuricemia with IFG, IFG-IGT, and diabetes in population, and the predominant association was found in females than in males, taken into account the confounding factors.

**Keywords:** Beta cell dysfunction, Insulin resistance, Uric acid.

# Evaluation of Liver Function Tests in Patients on Atypical Antipsychotic Drugs: A Case-control Study

Abstract-113

**GN Pradeep, R Babu Rao****Department of Biochemistry, Government Medical College, Suryapet, India.**

**Introduction:** Atypical antipsychotic drugs commonly cause increase in the liver enzymes. However they rarely may induce a serious hepatic toxicity. Asymptomatic liver test abnormalities are reported in more than 20% of the patients treated with these drugs.

**Aims and Objectives:** To evaluate the liver function test on patients with atypical antipsychotics drugs namely Olanzapine, Risperidone on the hepatic enzymes and serum Bilirubin levels in psychiatric patients and to estimate the levels to compare it with the healthy controls.

**Material and Methods:** The present study was a case-control study, conducted from June 2023 to August 2023 in Government General Hospital, Suryapet, Telangana, India. A total of 50 blood

samples were collected from patients attending Psychiatry OPD on atypical antipsychotic drugs and hepatic enzymes are analysed in Randox RX Moderna and compared with the 50 healthy controls.

**Results:** Transaminases and Gamma-Glutamyl Transferase (GGT) concentrations were elevated in patients. Alkaline phosphatase and Bilirubin levels were slightly elevated in patients when compared to the healthy controls.

**Conclusion:** Present study found that liver function test abnormalities in patients treated with atypical antipsychotics and significant differences in Hepatic enzymes and Serum Bilirubin levels compared to the concentration of healthy individuals.

**Keywords:** Liver enzymes, Olanzapine, Risperidone.

# Turn around Time- Important Quality Assessment Tool

Abstract-114

**V Raghavi, Postgraduate student, Department of Biochemistry, Chengalpattu Medical College and Hospital, Tamil Nadu, India.**

**Introduction:** Majority laboratories around the globe have attentive on improving the analytical quality of laboratory tests. Laboratory Turnaround Time (TAT) is often left inconspicuous and under-recognised in the healthcare setting. Both patients and clinicians are more gripped in receiving rapid, definitive, and faultless results. This can be achieved by improving the TAT through the rapport of the causes that lead to delayed TAT.

**Aims and Objectives:** This anticipated study aims to spot the cause of delayed TATs within the outpatient department and contrivance corrective strategies to tame them.

**Materials and Methods:** The present study was an observational study conducted in the clinical Biochemistry Lab of our Institute. A total of 214 samples were received. The study was usher for a period of two months; of all the samples received, 154 were from the outpatient department, and 78 samples exceeded the expected TAT. The samples were analysed in the clinical biochemistry department of the hospital. The time spent at each station was determined using an internal computer system, which was also used to pin down the samples that eclipse TATs. The major outcome of the study was to

identify the aggregate of samples exceeding TAT and the causes of it.

**Results:** Upon enactment of punitive compute and root cause analysis, the TATs were diminish from 80-88% to 11-33%. After analysing the time span of time for the samples that exceeded TAT, 45.1% and 37.5% exceeded 30 minutes in month 1 and 2, respectively. Only 3.2% and 6.2% exceeded five hours in month 1 and month 2, respectively. More over, using root cause analysis, it was found that 12% of the delay was due to soar waiting time or sample collection, 14% included other causes such as externalising of samples, and 18% of the delay was due to preanalytic processing time.

**Conclusion:** Present research conjecture that TAT is an vital quality assessment tool within the laboratory mounting, and with proper rapport of causes, it can be revamped. Although monitoring TAT is a tedious activity that edict stupendous efforts, with the presence of real-time monitoring, improving TAT is an achievable goal. This, in turn, can upgrade patient treatment outcomes and clinician satisfaction.

**Keywords:** Assessment tool, Clinical biochemistry, Satisfaction.

# Alteration of miRNA-146a Levels in Women with PCOS: A Systematic Review

Abstract-115

**E Deepalakshmi, Santhi Silambanan, K Sowmya****Department of Biochemistry, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.**

**Introduction:** Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder in reproductive age group women, characterised by hormonal imbalance, irregular menstrual cycle and infertility. It manifests as irregular menstrual bleeds, excessive androgen levels, hirsutism, acne and polycystic ovaries. MicroRNAs (miRNAs) are small 22 nucleotide long, non coding, single-stranded highly conserved molecules which regulate gene expression. In PCOS dysregulation of miRNAs was observed impacting pathways related to inflammation, and ovarian function. Various miRNAs like miRNA-93, miRNA-29a, miRNA-21, and miRNA-146a show altered expression in PCOS women. miRNA-146a is a novel marker and essential regulator of pathogenesis in PCOS.

**Aims and Objectives:** A systematic review and meta-analysis was performed to have a comprehensive understanding of the role of miRNA-146a in PCOS.

**Materials and Methods:** Systematic search on articles (2014 to 2023) assessing the role of miRNA-146a in PCOS was performed in

Pubmed, Embase, Google scholar and other databases. Key words used were microRNA, miRNA, miRNA146a, and PCOS. Original studies on miRNA-146a performed in blood/serum of PCOS women were included. Studies performed in other body fluids and animal models were excluded. Results were analysed in RevMan version 5.4 and forest plot was obtained.

**Results:** Three research articles were included. There was up-regulation of miRNA-146a in women with PCOS. Forest plot was derived.

**Conclusion:** Studies have shown that miRNA-146a influences PCOS by regulating androgen levels and inflammation. Thus a complex interaction is present between miRNA and target genes. Drugs which can enhance miRNA-146a expression could be beneficial in PCOS women.

**Keywords:** Forest plot, Irregular menstrual, Polycystic ovary syndrome.

# Correlation of Serum Testosterone and HbA1c Levels in Males with Type 2 Diabetes Mellitus

Abstract-116

**Racha Shalini, PG Student, Department of Biochemistry, Osmania Medical College, Hyderabad, Telangana, India.****P Kiranmai, Professor, Department of Biochemistry, Osmania Medical College, Hyderabad, Telangana, India.**

**Introduction:** Testosterone is a steroidal hormone that plays an important role in the regulation of carbohydrate, protein, lipid metabolism, thereby control insulin sensitivity. Decreased serum testosterone in Type-2-Diabetes Mellitus promotes accumulation of visceral fat, which increases insulin resistance and in turn, leads to progression of Diabetes Mellitus.

**Aim:** To determine correlation of serum total testosterone and HbA1c levels in males with T2DM.

**Materials and methods:** In a cross-sectional study conducted for the duration of 18 months, 100 T2DM men (aged 35-55 years) were recruited. Fasting Plasma Glucose estimated using Beckmen coulter au5800 HbA1c measured by D10 Biorad. Serum testosterone measured by fully automated Siemens analyser.

Parameters were analysed using Statistical Package for Social Sciences (SPSS) 17.0 version of stastical software. Pearson's

coefficient level of p-value <0.05 were considered as statistically significant, and p-value <0.001 as highly significant.

**Results:** In T2DM patients, out of 100 diabetic patients, 39 patients had lower level of serum total testosterone when compared to the reference range (<300 ng/dL). In a present study, there was a positive correlation between serum testosterone and HbA1c levels in T2DM in males.

**Conclusion:** Testosterone not only plays a prime role in men's sexual health but also have an influence on glycaemic status of diabetic patients. Assessment of lower serum total testosterone levels can serve as a useful tool for evaluation of prognosis of T2DM.

**Keywords:** Insulin resistance, Steroidal hormone, Visceral fat.

# Study of Gamma Glutamyl Transferase as an Independent Determinant for the Association of Insulin Resistance with Non Alcoholic Fatty Liver Disease in a Tertiary Care Hospital

Abstract-117

**B Midhun, R Rangarajan****Department of Biochemistry, Government Mohan Kumaramangalam Medical College and Hospital, Salem, India.**

**Introduction:** Non Alcoholic Fatty Liver Disease (NAFLD) is a major cause of liver-related morbidity and is frequently associated with insulin resistance syndrome.

**Aims and Objectives:** To examine the association of serum GGT and Homeostasis Model Assessment-estimated Insulin Resistance (HOMA-IR) in patients with NAFLD.

**Materials and Methods:** The present study was a case-control study conducted at GMKMCH, Salem, Tamil Nadu, India. A total of 120 patients attending Medicine OPD and admitted in Medicine ward were included of which 60 normal controls, 60 were NAFLD subjects. Inclusion criteria were normal subjects, subjects with NAFLD, both sexes. Exclusion criteria were Septic conditions,

Cardiac diseases, hepatic, renal, respiratory failure, Hepatitis B, hepatitis C, Pregnancy.

**Results:** NAFLD subjects had significantly higher levels of GGT and HOMA-IR as compared to their non NAFLD counterparts. There was a significant positive association of HOMA-IR with GGT. Also, HOMA-IR and GGT were found to be significant determinants of NAFLD.

**Conclusion:** These results suggest that elevated levels of GGT and insulin resistance are more likely to develop NAFLD and thus support a role of these determinants in the pathogenesis of NAFLD.

**Keywords:** Liver morbidity, Insulin resistance syndrome, Pathogenesis.

# To Correlate the Lipid Profile Variations in Women with PCOS

Abstract-118

**A Induja, Vishaka Mahajan****Department of Biochemistry, Indira Gandhi Government Medical College and Hospital, Nagpur, Maharashtra, India.**

**Introduction:** Polycystic Ovary Syndrome (PCOS), is a common endocrine disorder with lipid disturbances by stimulation of lipolysis and altered lipases. The altered lipid profile is associated with the increased risk of cardiovascular disease and central obesity.

**Aim and Objectives:** To correlate the lipid profile variations in women with PCOS. To elucidate the mechanisms of lipid metabolism abnormalities in the development of PCOS.

**Materials and Methods:** This observational cross-sectional hospital-based study was conducted from January 2023 to September 2023. According to Rotterdam criteria 75 women (age 24.5±4.5 years) diagnosed with PCOS in OPD of Obstetrics and Gynaecology in IGGMCH, Nagpur were included. Samples were

taken after overnight fasting, and then serum lipid levels were analysed using enzymatic colorimetric methods.

**Results:** The frequency of low HDL and High Cholesterol, LDL, VLDL and triglycerides were seen in women with obese PCOS. No statistical significant differences were found in underweight PCOS Women (BMI<18.5) and Normal PCOS Women (BMI 18- 24.99).

**Conclusion:** PCOS women with increased BMI presented with deranged lipid profile have a strong correlation between lipid metabolism and PCOS which may explain the increased risk of long term cardiovascular disease and central obesity. So regular screening of serum lipids is essential for obese PCOS women.

**Keywords:** Endocrine disorder, Obesity, Polycystic ovary syndrome.

# Study of Comparison between Total Bilirubin and Total Bilirubin/Albumin Ratio with Disease Activity in Rheumatoid Arthritis Patients

Abstract-119

**S Nithya, UN Priyadarshini**

Postgraduate, Associate Professor, Department of Biochemistry, GMKMCH, Salem, India.

**Introduction:** Rheumatoid Arthritis (RA) is a chronic inflammatory systemic autoimmune disease marked by polyarthritis with extra-articular manifestations like vasculitis, pericarditis and lung involvement. Key role in the pathogenesis of RA involve oxidative stress. Bilirubin at physiologic or moderately elevated concentrations has potent antioxidant and immunomodulatory properties.

**Aim:** To study the relation between total bilirubin, total bilirubin/albumin ratio and disease activity in rheumatoid arthritis.

**Methodology:** This was a cross-sectional study was conducted for the duration of two years involving 102 RA patients fulfilling 2009 RA criteria of American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR). DAS28-ESR was used for evaluating Disease activity and classified into three groups

as Remission and Low: DAS28-ESR<3.2, Moderate:3.2≤DAS28 ESR≤5.1 and High: DAS28-ESR>5.1. Samples were collected and serum bilirubin, albumin, C-reactive protein (CRP), ESR, RF-IgM and IL-6 were measured.

**Result:** The total bilirubin and total bilirubin/albumin ratio in RA patients were significantly (p-value <0.05) lower than healthy controls. In RA patients, bilirubin and total bilirubin/ albumin ratio were negatively correlated with disease activity and inflammatory markers analysed by spearman's rank correlation.

**Conclusion:** Bilirubin has inverse association with reduction of disease activity in RA patients. Thus, bilirubin may be a protective factor for RA aggravation.

**Keywords:** Autoimmune disease, C-reactive protein, Pericarditis.

# Study of Thyroid Function and Vitamin B12 Levels in Beta Thalassemic Patients

Abstract-120

**J Nandhini, T Rajalakshmi**

Department of Biochemistry, Government Mohan Kumaramangalam Medical College and Hospital, Salem, India.

**Introduction:** Thalassemia is a condition that affects haemoglobin synthesis and is one of the most common hereditary disorders in the world. Endocrine disorders, especially thyroid dysfunction are more prevalent in  $\beta$ -thalassemic patients. The bone marrow responds to chronic haemolysis by increased Red Blood Cells (RBCs) production and results in relative deficiency of vitamin B12.

**Aim:** To evaluate the thyroid function and Vitamin B12 levels in  $\beta$ -thalassemic patients.

**Methodology:** The present study was a case-control study was conducted for the duration of three years, involving 60  $\beta$ -thalassemic patients (30  $\beta$ -thalassemia major and 30  $\beta$ -thalassemia minor) and 40 control subjects. Serum T3, T4, TSH, Ferritin and Vitamin B12 measured by eCLIA.

**Results:**  $\beta$ -thalassemia major patients had significantly higher levels of serum TSH and Ferritin, and significantly lower levels of serum T4 when compared to controls.  $\beta$ -thalassemia major patients showed significant decrease in Vitamin B12 levels compared to controls. A significant positive correlation was observed between TSH and Ferritin, and significant negative correlation was observed between Vitamin B12 and Ferritin.

**Conclusion:**  $\beta$ -thalassemic patients are prone for hypothyroidism, so they are in need of thyroid hormonal assessment. Vitamin B12 deficiency occurs in  $\beta$ -thalassemic patients, so biochemical screening of Vitamin B12 can be of paramount importance in these patients.

**Keywords:** Haemoglobin synthesis, Haemolysis, Hereditary disorders.



# Altered Levels of miRNA-222 in Women with PCOS: A Systematic Review

Abstract-121

S Umarani, Santhi Silambanan, K Sowmya

Department of Biochemistry, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.

**Introduction:** Polycystic Ovarian Syndrome (PCOS) is a common heterogenous disorder in women of reproductive age group, it is a common cause of hyperandrogenism and female infertility. PCOS is diagnosed based on Rotterdam criteria as 1) Anovulation 2) Hyperandrogenism 3) USG findings - follicle size should be more with 12 mm, 12 to 15 follicles in both ovaries should be present and cyst volume should be more than 10cc. MicroRNA (miRNA) is a small non coding RNA produced in all cells of body, that helps in post-translational regulation of gene expression and are involved in metabolic homeostasis. In women with PCOS miRNA were found to be differentially expressed. Among circulating miRNA, miRNA-222 was strongly and positively associated with insulin resistance.

**Aims and Objectives:** A systematic review and meta-analysis were performed to know the role and pathology of miRNA-222 in PCOS women.

**Materials and Methods:** Systematic search on articles (2014-2022) assessing the role of miRNA 222 in PCOS was performed in Pubmed, google scholar and other data bases. Key words used were microRNA, miRNA 222 and PCOS. Studies performed in serum were included. Studies performed with other body fluids and animal studies were excluded. Results were analyzed in Revman version 5.4 and forest plot was obtained.

**Results:** Three research articles were included. There was alteration in miRNA 222 in women with PCOS. Forest plot was derived.

**Conclusion:** In PCOS, miRNA 222 is found to be associated with insulin resistance, probably by modulating Phospho inositol 3 kinase- AKT signaling pathway. Thus, drugs targeting insulin resistance could improve the metabolic profile in PCOS women.

**Keywords:** Anovulation, Heterogenous disorder, Polycystic ovarian syndrome.

# A Systematic Review of the Association between miRNA-21 Levels with Obesity in Women with PCOS

Abstract-122

Iyyama Gowri, M Ganesh, Santhi Silambanan, K Sowmya

Department of Biochemistry, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.

**Introduction:** Polycystic Ovarian Syndrome (PCOS) is the most common reproductive endocrine disorder defined as a complex combination of chronic anovulation, hyperandrogenism and presence of polycystic ovaries. Micro RNAs are small, single stranded, non coding RNA molecules containing 21-23 nucleotides involved in RNA silencing and regulation of gene expression. Several miRNAs involved in PCOS are miRNA-93, miRNA-103, miRNA-223, miRNA-146. miRNA-21 is noteworthy for its association with obesity in PCOS women.

**Aims and Objectives:** A systematic review and meta-analysis were performed to have an elaborative understanding of the role of miRNA-21 in PCOS and associated obesity.

**Materials and Methods:** A systematic search was done for the period of four months to assess role of miRNA-21 in PCOS through

Pubmed, Embase, Google scholar and other databases. Key words used in search were microRNA, miRNA-21, PCOS, obesity. Relevant and Original studies on miRNA-21 in blood/serum of PCOS women were included. Results were analysed in RevMan version 5.4 and forest plot was obtained.

**Results:** Three out of the four research articles that were included showed that miRNA-21 was upregulated with respect to obesity in PCOS women.

**Conclusion:** Studies have shown that obesity plays role in development of PCOS by influencing levels of miRNA-21 through a complex interaction with its target gene. Therapeutically targeting this interaction might be beneficial in PCOS.

**Keywords:** Hyperandrogenism, Forest plot, Polycystic ovarian syndrome.

# Association of Serum Lactate Dehydrogenase with International Staging System in Patients with Newly Diagnosed Multiple Myeloma

Abstract-123

**B Sai Sravani, M Vijaya Bhaskar, M Noorjahan, KSS Sai Baba, Siraj Ahmed Khan, NN Sreedevi, S Bhavya**  
Department of Biochemistry, Nizams Institute of Medical Sciences, Hyderabad, India.

**Introduction:** Multiple Myeloma (MM) is a plasma cell malignancy in which monoclonal plasma cells proliferate in bone marrow. Based on serum Albumin and Beta 2 microglobulin levels, a prognostic criterion, International Staging System (ISS) created which has three stages. The International Myeloma Working Group (IMWG) published the Revised International Staging System (R-ISS) by combining ISS with chromosomal abnormalities detected by interphase FISH (iFISH) and Serum LDH levels.

**Aims and Objectives:** To evaluate the association of Serum LDH and ISS in newly diagnosed MM patients.

**Materials and Methods:** A total of 98 patients with newly diagnosed MM according to IMW guidelines from Nizams Institute of Medical Sciences, Hyderabad, India, from the year 2021 to 2023, were studied retrospectively. Patient data was collected from Hospital records. Three groups were made based on ISS: stage 1 group (n=29) stage 2 group (n=21), stage 3 group (n=48).

**Results:** 51% (n=29), 90% (n=21), 97% (n=48) of patients in stage 1, stage 2, stage 3 respectively showed raised LDH levels (>225 U/L). A strong positive correlation between serum LDH and beta2 microglobulin (r-value=0.6869, p-value <0.001) and negative correlation between serum LDH and albumin (r-value=-0.20, p-value <0.04).

**Conclusion:** Raised serum LDH in patients with MM can be correlated with the increase in the tumour burden. The patients who have LDH $\geq$ 225U/L at the time of diagnosis should be considered to have poor prognosis. LDH when combined with the ISS, has proven its significance in present study groups, despite methodological improvements like iFISH, this combination helps in severity prediction, reassures relevance, more importantly low cost and accessible, even in resource shortage areas.

**Keywords:** Bone marrow, Chromosomal abnormalities, International staging system.

# Serum Homocysteine and its Association with Lipid Profile in Patients with Dyslipidaemia

Abstract-124

**Kavya Sasank, SB Sharma, Gini Garima**  
Department of Biochemistry, ESIC Medical College and Hospital, Faridabad, Haryana, India.

**Introduction:** Homocysteine, an intermediate sulphur containing amino acid has gained significant recognition as a risk factor for atherosclerosis. It is produced as an intermediate during conversion of methionine to cysteine. Hyperhomocysteinemia has been considered as a new modifiable risk factor for cardiovascular diseases such as coronary heart disease by various mechanisms including damage to vascular endothelium, smooth muscle cell proliferation, enhanced Low Density Lipoprotein Cholesterol (LDL-C) peroxidation, and thrombosis activation. Homocysteine also makes dyslipidaemia patients more prone to Cardiovascular Diseases (CVD). Recent studies clearly indicate the significance of metabolic balance between S-adenosylmethionine (SAM), S-adenosylhomocysteine (SAH), Phosphatidylcholine (PC), Phosphatidylethanolamine (PE), and choline in homocysteine metabolism, hypolipoproteinemia, liver function, and CVD although the mechanism of the link is not completely understood. Moreover, homocysteine reduces the concentration of High-Density Lipoprotein Cholesterol (HDL-C) in plasma by inhibiting the hepatic synthesis of apoA1, thereby enhancing the risk of atherosclerosis. Evaluation of the association between serum homocysteine levels and various components of

lipid profile in patients with dyslipidaemia may be helpful in assessing the risk of CVD and atherosclerosis.

**Aims and Objectives:** To assess the levels of serum homocysteine with the components of lipid profile in patients with high blood lipids and find out, if there is an association between serum homocysteine levels with lipid profiles.

**Materials and Methods:** The prospective case-control study was conducted for the duration of six months in the central biochemistry laboratory of ESIC Medical College and Hospital, Faridabad, India by taking 50 patients with high lipid profile as cases and 50 patients with normal lipid profile as controls. Serum lipid profile, which includes serum cholesterol, triglyceride, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL) and Very Low-Density Lipoprotein (VLDL) of the study subjects was analysed using ortho clinical diagnostics reagents on dry chemistry analyser VITROS XT7600. Serum homocysteine assay was performed using RANDOX DAYTONA wet chemistry analyser. Atherogenic Index of Plasma (AIP) was calculated using the formula  $\text{Log}(\text{serum triglyceride}/\text{serum HDL-C})$ . The data obtained are presented as mean $\pm$ SD values. The significance of the

mean difference between groups was estimated by Student's t-test. Relationships among parameters were determined by correlation analyses. The p-value <0.05 was considered statistically significant.

**Results:** The comparison between patients' group and the control group, the following results are obtained. The present study showed that a direct correlation exists between serum homocysteine levels and increased levels of total cholesterol, LDL levels and atherogenic index whereas a statistically significant negative correlation exists between serum homocysteine levels and HDL. All these factors are known risk factors for cardiovascular diseases.

**Conclusion:** Homocysteine is a marker of endothelial dysfunction, therefore assessment of homocysteine levels helps in early identification of patients at risk of developing cardiovascular complications. Estimation of serum homocysteine levels is therefore recommended as part of the screening and follow-up of dyslipidaemia patients.

**Keywords:** Atherosclerosis, Cardiovascular diseases, Endothelial dysfunction.

## A Study of Serum Gamma Glutamyl Transferase Activity, Body Mass Index and Lipid Profile in Type 2 Diabetes Mellitus

Abstract-125

Sukhdeep Singh Karrira, Department of Biochemistry, ESIC MC and Hospital, Gulbarga, India.

**Introduction:** Type 2 Diabetes Mellitus (T2DM) is a most prevalent disease in India which contributes to more than 50 million peoples suffering from this disease. It is a leading cause of morbidity. This occurs mainly due to absolute/relative deficiency of insulin. Obesity is an important risk factor for T2DM and is associated with fatty liver. Excess fat deposition in liver contributes to insulin resistance and development of T2DM. Gamma-Glutamyl Transferase (GGT) is a ectoplasmic antioxidant enzyme, used as index of liver dysfunction.

**Aims and Objectives:** To study interrelationship between blood glucose, Body Mass Index (BMI), serum GGT activity and lipid profile in T2DM.

**Materials and Methods:** The present study was a cross-sectional study conducted for the duration of four months. Study comprised

30 cases of T2DM with equal number of age matched healthy subjects as controls. Blood glucose, lipid profile and GGT activity determined, BMI was calculated. Statistical analysis was done.

**Results:** Present study found statistically significant increase in blood glucose, BMI, lipid profile, GGT activity in cases compared to controls. Present study showed there is a strong association between blood glucose, triglycerides, BMI and GGT activity in cases.

**Discussion:** Obesity contributes to insulin resistance. Decreased insulin sensitivity causes hyperglycaemia and hyperlipidaemia. Triglycerides deposition causes fatty liver leading to elevation of serum GGT.

**Conclusion:** Serum GGT activity is useful in assessing the risk of T2DM.

**Keywords:** Fatty liver, Insulin resistance, Obesity.

## ABG Parameters- Changes over Time and Storage

Abstract-126

Gurunathan, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.  
MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.  
Deepa, PG Student, Department of Biochemistry, Government Stanley Medical College, Chennai, India.  
Rajesh, PG Student, Department of Biochemistry, Government Stanley Medical College, Chennai, India.

**Introduction:** Arterial Blood Gas (ABG) analysis gives important information on pH, PO<sub>2</sub>, PCO<sub>3</sub> and Acid-Base status. Various preanalytical factors affect ABG analysis of which delay in transport, analysis and storage will greatly affect the accuracy of results.

**Aims and Objectives:** To determine the effect of sample storage and time delay in processing on ABG parameter.

**Materials and Methods:** In this observational study conducted for the duration of two months, five ABG samples received at 24 hrs biochemistry laboratory, Stanley medical college and hospital were

processed and taken as baseline. Of these samples, three samples were stored at room temperature and two samples were stored at 2-8°C and were subsequently processed at 1 hour, 2 hours and 4 hours.

**Results:** Irrespective of storage at room temperature and refrigerator decrease in pH was noted from 1 hour collection due to increase in pCO<sub>2</sub>. PO<sub>2</sub> was found to equilibrate with atmospheric pO<sub>2</sub>. Sodium and potassium showed mild increase at room temperature and a significant increase on refrigerator.

**Conclusion:** As ABG parameters vary significantly with time and storage, it is mandatory to analyse those samples within 30 minutes of collection.

**Keywords:** Acid base status, Accuracy, Arterial blood gas.

# A Comparative Study of Sodium Fluoride and Serum Separator Tubes for Blood Glucose Estimation

Abstract-127

**SB Raja, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**MS Gayathri, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**S Suganya, PG student, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** The estimation of blood glucose levels is one of the most frequently ordered biochemical analyses. The glucose is unstable in whole blood, the concentration of glucose in blood samples decreases rapidly at room temperature because of glycolysis. Sodium fluoride is an inhibitor of glycolysis. So, the use of sodium fluoride as an antiglycolytic agent has become a wide spread and established practice.

**Aims and Objectives:** To evaluate the efficacy of sodium fluoride tubes and serum separator tubes in analysing blood glucose levels.

**Materials and Methods:** In this comparative study conducted for the duration of one month, blood was collected from 15 healthy volunteers at Government Stanley Medical College and Hospital, Chennai, Tamil Nadu, India. The collected blood samples were

distributed into sodium fluoride and serum separator tubes. Serum was separated according to the protocol and blood glucose was estimated by GOD-POD method in Autoanalyser (Pentra-400).

**Results:** There was no statistically significant difference in p-values of 0.559, 0.704 and 0.789 at 1 hour, 2 hour and 4 hours respectively. Glucose values were measured in the serum separator tube and sodium fluoride tubes.

**Conclusion:** There was no difference between use of a sodium fluoride tubes or a serum separator tubes for upto four hours. Therefore, the serum separator tube and sodium fluoride tube can be used for blood glucose analyses.

**Keywords:** Autoanalyser, Biochemical analyses, Glycolysis.

# Effects of Icteric Interference on Routine Biochemistry Parameters

Abstract-128

**Prasanth Kumar Kandi, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**R Gayathri, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**P Sridevi, PG Student, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Icteric samples are still the most common causes of falsely decreased creatinine values in biochemical assay. To estimate the effects of high bilirubin samples on other analytes like glucose, Aspartate Aminotransferase (AST), Alkaline Transaminase (ALT) and Alkaline Phosphatase (ALP) in this study.

**Objective:** To evaluate the interference of high bilirubin on estimation of Glucose, AST, ALT and ALP.

**Materials and methods:** The present study was an observational study conducted for the duration of one month. 10 icteric samples of bilirubin (>20 mg/dL) received in the lab was utilised to analyse AST, ALT, ALP and Glucose values. After quality control is passed all the above four analytes, were estimated in XL-1000 autoanalyser.

Glucose by (Glucose oxidase and per-oxidase method), AST and ALT by (IFCC, without pyridoxal phosphate method) and APL by (AMP method-2 amino 2 methyl 1 propanal method).

**Results:** When compared to baseline value, glucose was significantly increased after 1:5 dilution. Other analytes like AST, ALT and ALP is not significantly altered after dilution. It indicates bilirubin has negative interference on glucose. Bilirubin has no analytical interference on AST, ALT and ALP.

**Conclusion:** The study indicates that each laboratory should evaluate icterus interference on each analytes before releasing the reports of Icteric samples.

**Keywords:** Autoanalyser, Bilirubin, Icterus.

# Comparison of Thyroid Function Test in Fasting and Postprandial Samples

Abstract-129

**SP Sumathi, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Sudharani Michael, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**S Suganya, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Studies show that Thyroid Stimulating Hormone (TSH) level vary in relation to food. In this study, authors have addressed the question of whether a fasting and postprandial sample would make a clinically significant difference in Thyroid Stimulating Test (TST).

**Aims and Objectives:** To determine the effect of fasting and postprandial state on TSH and fT4.

**Material and Methods:** In this cross-sectional study conducted for the duration of one month, 15 samples were collected from OPD at Government Stanley Medical College and Hospital, Chennai. Patients who had come to give blood for fasting and postprandial glucose test for their diagnosis and their samples were used for this study. Serum separation was done according to the protocol. TSH and fT4 were analysed for the samples by CLIA method in Beckmen Coulter DXI-600 Immunoassay.

**Results:** From the TSH analysis fasting samples had mean of 4.55  $\mu$ U/mL and SD=7.78, Postprandial sample had mean of 3.73  $\mu$ U/mL and SD=6.85, which was 19% lesser than the fasting value, and for fT4, fasting sample had mean of 0.846 ng/dL and SD= 0.099 and postprandial sample had mean of 0.77ng/dL and SD=0.11, which is 9% lesser than the fasting value.

**Conclusion:** Compared with the fasting and postprandial TFT demonstration, there was a reduction in postprandial samples. So it can be concluded that the food affects the TFT value and it is preferred to take samples for TFT in fasting condition only.

**Keywords:** Postprandial glucose, Immunoassay, Thyroid stimulating hormone.

# The Change of Urine pH with Time: An Observational Study

Abstract-130

**S Shanmugavelan, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Lourdes Sandy, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**Renuka, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Routinely pH of urine samples are measured in our hospital for our various conditions. Delay in processing the urine samples can give erroneous result in the pH values, which can result in wrong interpretation and unnecessary intervention. Since prolonged storage can lead to overgrowth of urea – splitting bacteria and a high urine pH. This study was conducted to show the change in urine pH with time.

**Aims and Objectives:** To determine the change of urine pH with time. To determine the correlation of urine PH and presence of nitrite in urine.

**Materials and Methods:** In this observational study conducted for the duration of one month, urine was collected from five healthy

volunteers and pH was analysed by using pH meter after calibration with known standards at 0 hrs, 2 hrs, 4 hrs, 6 hrs, 24 hrs. The same urine was analysed with urine dipstick to detect nitrite.

**Results:** Increase in pH value was noted from 2 hrs of collection as measured by pH meter. Change in colour due to the presence of nitrite was noted from two hrs of collection as tested by urine dipstick.

**Conclusion:** Prolonged storage of urine is associated with alkaline change of pH secondary to bacterial degradation of nitrogenous urine analytes. So, urine sample received for pH measurement should be tested as soon as possible.

**Keywords:** Dipstick, Prolonged storage, Nitrite.



# Comparison of Biochemistry Analytes in Serum and Plasma: An Observational Study

Abstract-131

**A Sridharan, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**K Aruna Devi, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**  
**K Rajesh, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** In a standard clinical laboratory, one usually use serum for biochemical assays. There are huge data on evaluation of the difference in serum versus plasma sample assay of commonly tested biochemical parameters in clinical laboratory. This study was aimed to document the difference between analytes value in serum and plasma processed using common standardised protocols in our 24 hours clinical biochemistry laboratory.

**Aims and Objectives:** To determine the significant differences in value of biochemical analyte in serum and plasma.

**Materials and Methods:** The present study was an observational study conducted for the duration of one month. Venous blood samples from 10 patients received in EDTA and serum separator tubes in 24 hrs biochemistry lab, were collected and then serum

separation done as per protocol. Total of 13 analytes were tested on ERBA XL-1000 and electrolytes in ST-200.

**Results:** Percentage difference between serum versus plasma sample for all analytes, ranged for 0.0% to 98.8% and were <20% for majority of parameters except total bilirubin (46.3%), ALP (98.8%) and Calcium (96.7%) which are higher in serum then plasma and K<sup>+</sup>(75.8%) higher in plasma then serum.

**Conclusion:** On analysing the serum and plasma of 13 different analytes and electrolytes, there was a significant difference in calcium, ALP and total bilirubin which are low, LDH and potassium was high in EDTA tubes. There was no significant difference in serum and plasma of other analytes.

**Keywords:** Biochemical assays, Clinical laboratory, Standardised protocols.

# An Insight into Huntington Disease at Cellular and Molecular Level

Abstract-132

**Sana Firdous, Ayaan Institute of Medical Sciences, Kanakamamidi Village, Moinabad, Hyderabad, Telangana, India.**

**Introduction:** Huntington disease, an autosomal dominant neurodegenerative disease is caused by the expansion of polyglutamines (CAG) on exon 1 of HTT gene at Chromosome 4 with a complete penetrance. The main clinical manifestations are chorea, cognitive and psychiatric impairment followed by dementia and inevitable death. The cellular events responsible for neuronal dysfunction in Huntington's disease includes clumps of mutated Huntingtin, excitotoxicity, changes in cholesterol metabolism, mitochondrial dysfunctions, energy deficits and transcriptional dysregulation. HTT clumps cause sequestration of CPEB, a protein which helps in the maintenance of memory. Other factors responsible for Huntington's disease include polymorphism in  $\Delta$ -2642 GA, GluR6, NMDA receptor subunit 2B, ASK-1, MAP2K6, PPAR- $\alpha$  coactivator 1- $\alpha$  genes related to mitochondrial activity CHCHD2, GPCRB161 allele colocalizes with expanded CAG repeats during DNA repair process.

**Aims and Objectives:** The current research was carried out underlying the pathogenesis of Huntington's disease at cellular and molecular level.

**Materials and Methods:** The present study was an experimental study conducted for the duration of two years. The molecular mechanisms were studied by using various animal models. *Drosophila melanogaster*, *Caenorhabditis*, *Danio-rerio* are cheaper, faster and simple models. The in-vitro studies are carried out using Huntington's disease patient derived cell lines such as Fibroblast derived cell lines or Pluripotent stem cell lines.

**Results:** During DNA replication, slippage within the coding region results in triple CAG repeat expansion. The expansion was higher in spermatogenesis than oogenesis. CAG repetition above a threshold level leads to genetic changes during disease. Huntington's disease exhibits anticipation and has 100% penetration.

**Conclusion:** The knowledge gained by studying cellular and molecular mechanisms will help the researchers to get an insight of the disease so as to treat it specifically. Genetic intervention for early detection, spreading awareness about Huntington's disease and its symptoms can improve the lifestyle of patients.

**Keywords:** Cholesterol metabolism, Neurodegenerative disease, Psychiatric impairment.

# An Observational Study on the Stability of Serum Enzyme Activity at Room Temperature

**Keerthika, DMLT, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**MP Saravanan, Professor and Head, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**J Rathi Roopavathy, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**S Ragasudha, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.**

**Introduction:** Enzymes are biocatalysts that function only under specified temperatures with activity getting declined over change in time and temperature.

**Aims and Objectives:** To assess the stability by observing changes in serum enzyme activity at room temperature.

**Materials and Methods:** The present study was an observational study conducted for the duration of one month. The sample size of the study was 20 serum samples received in clinical biochemistry section of Govt. Stanley Hospital. Serum samples were analysed for enzymes including SGOT, SGPT, ALP, Amylase, LDH, CK, CK-MB. Subsequent measurements of the enzyme activities were done at 4 hrs, 6 hrs, 8 hrs from the time of serum separation.

**Results:** The results of the present study showed significant decrease in enzyme activity for LDH and CK-MB ( $p$ -value  $<0.05$ ).

The changes observed for other enzymes including SGOT, SGPT, ALP, Amylase, CK were found insignificant.

**Conclusion:** Laboratory plays a vital role in healthcare services. Sample transportation and length of storage may affect the outcome of results. Each serum biochemical has inimitable stability at room temperature. In this study it was observed that Serum ALP, SGOT, SGPT, CK were found to be stable even after sometime delay but there was significant changes among LDH and CK-MB values upon storage over a different period at room temperature, so it is advisable to run these samples within 2 hrs of collection. This helps in the laboratory precision and accuracy.

**Keywords:** Biocatalysts, Enzyme activity, Healthcare services.

# Alzheimer's Disease and the Biochemistry behind it

**Harini Rajesh, 1<sup>st</sup> Year MBBS, Department of Biochemistry, Stanley Government Medical College, Chennai, India.**

**Sridevi, Final Year Postgraduate, Department of Biochemistry, Stanley Government Medical College, Chennai, India.**

**Sudharani Michael, Associate Professor, Department of Biochemistry, Stanley Government Medical College, Chennai, India.**

**Introduction:** Alzheimer's Disease (AD) is neurodegenerative disease involving the accumulation of beta amyloid protein as plaques and neurofibrillary tangles of hyperphosphorylated tau protein. These two important biomarkers are studied in this poster including the mechanisms synthesis and clearance, and its defects which leads to accumulation and eventually clinical signs of AD in patients.

**Case Report:** A 68-year-old female, diabetic and hypertensive with eight-month history of progressive memory loss and difficulty in completing daily tasks. Mini-Mental State Examination (MMSE) score - 19 out of 30 (normal 23+). Dementia Assessment for Rapid Test (DART) had elevated score - cognitive decline. She became increasingly cognitively impaired, showing confusion, irritability, possessiveness, other behavioural changes. Given acetylcholinesterase inhibitors to relieve symptoms. Over next two years, non verbal, unable to perform self-care. Switched to N-methyl-D-aspartate receptor inhibitor medication. She died at the

age of 71 due to AD related complications. Her blood tests were normal for her age and history, but on testing of cerebrospinal fluid it was revealed that her total tau and phosphorylated tau protein were elevated, and beta amyloid-42 levels decreased.

**Discussion:** Tau protein: Microtubule-associated protein found in neurons, assisting with assembly, formation, stabilisation. In AD they are hyperphosphorylated causing them to stick together and accumulate in an insoluble form – Neurofibrillary tangles. Also associated with Tauopathies. Beta amyloid: Peptides of 36-43 amino acids. Derived from Amyloid Precursor Protein (APP) which is a type I transmembrane protein in neurons and plays a role in neuronal development, signalling, intracellular transport, and other aspects of neuronal homeostasis. Beta amyloid is normally eliminated. Its accumulation indicates AD.

**Keywords:** Beta amyloid protein, Biomarkers Neurodegenerative disease.

# Acute Kidney Injury

Abstract-135

**S Karthik Kandaswami, 1<sup>st</sup> Year MBBS, Stanley Government Medical College, Chennai, India.**

**Introduction:** Acute kidney injury is a rapid decline in kidney function, marked by a sudden increase in serum creatinine levels, decrease in glomerular filtration rate or both, often caused by issues like dehydration, reduced blood flow to the kidneys, infections, medications or kidney damage due to injury or illness.

**Case Report:** A 32 year-old female, 26 weeks pregnant admitted on 31/10/23 at 9:30pm with c/o headache and vomiting patient was positive for palor and icterus. The next day, since 2 am- urine output was decreased 5 am- urine output-nit delivery induced vaginally, products of conception expelled @7am-GTCS-1 episode has occurred Initial episode of seizure treated with MgSO4 2 units FFP: 4 units platelets: 2 units PRBC Peritoneal dialysis done on 1/11/23 18 cycles Haemodialysis done on 4/11/23.

**Discussion:** Prevalence of AKI in India is about 8.36 cases per 1000 person. Most of the patients are of in the age of greater than

65 years and showed a male predominant sepsis was found to be the most common etiology and a risk factor for mortality DM and UTI were then other risk factors associated with mortality in AKI patients. Maler pts with akin were at risk for progressing to CKD. Among all, one third of the patients required dialysis were as rest were managed conservatively. Majority of the patients recovered from AKI, 5% progressed to CKD and above 16% of them died.

**Conclusion:** In conclusion, AKI underscores the significance of proactive healthcare measures, emphasising the need for timely diagnosis, effective treatment, and preventive strategies to mitigate risk factors. Improved awareness, early intervention, and ongoing research are essential for addressing this critical condition and enhancing patient outcomes.

**Keywords:** Glomerular filtration rate, Kidney function, Serum creatinine.

# Severe Acute Malnutrition

Abstract-136

**Yazhini, MBBS Student, Stanley Government Medical College, Chennai, India.**

**Introduction:** Severe Acute Malnutrition is defined in these guidelines as the presence of edema of both feet or severe wasting (weight- for -height/ length <-3SD or mid- upper arm circumference <115 mm).

**Case history:** Fever for 4 days, cough and cold for 4 days, vomiting for 1 day, breathlessness for 1 day.

**Diagnosis:** Bronchopneumonia /developmentally normal / severe acute malnutrition fully.

**Conclusion:** India should be free of malnutrition by 2030.

**Keywords:** Bronchopneumonia, Edema Severe wasting.

# Antioxidant vs Heart Disease

Abstract-137

**S Aswath Krishna, 1<sup>st</sup> Year MBBS, Stanley Government Medical College, Chennai, India.**

**Introduction:** Oxidative stress plays an important role in the aetiopathogenesis of Coronary artery diseases. Antioxidants are substances which can nullify or decrease the harmful effects caused by oxidative stress.

**Aims and Objectives:** This review aims to explore the interrelation between heart disease and oxidative stress and antioxidant treatments.

**Materials and Methods:** The literature search was performed using search terms "oxidative stress", "cardiovascular diseases", "antioxidants", "nutritional supplements", alone or In combination. All articles included were from peer-reviewed journal in English.

**Results:** Increased vitamin E levels are associated with decreased Coronary Heart Disease (CHD) mortality and inversely correlated with risk of angina. Studies support the antioxidant and endothelial effects of vitamin C but further studies are required. Natural and synthetic antioxidant drugs could have some benefits.

**Conclusion:** Use of various types of antioxidants have been proven to have beneficial effect in the management of CHD.

**Keywords:** Antioxidant treatments, Nutritional supplements, Oxidative stress.

# BIOMEDICAL RESEARCH ABSTRACTS

## Association of Platelet Indices with Glycaemic Index in Patients with Diabetes Mellitus

Abstract-138

**BV Swaroop Raj, KU Chinmayi**  
**Department of Pathology, Yenepoya Medical College, Mangalore, India.**

**Introduction:** Diabetes Mellitus is a global burden in most countries with prognosis depending on glycaemic index and microvascular complications. Platelet indices such as Mean Platelet Volume (MPV), Plateletcrit (PCT), Platelet Distribution Width (PDW) and Platelet Large Cell Ratio (PLCR) are available with haemogram in most haematology analysers. These parameters are used in platelet disorders to predict platelet activation. In diabetes they may indicate platelet activation due to vascular complications. Hence the study was done to find the association of platelet indices with glycaemic index and further predict vascular complications.

**Aims and objectives:** To determine platelet indices in diabetics and correlate the glycaemic index (HbA1c levels) with platelet indices.

**Materials and Methods:** Platelet indices and HbA1c levels from 50 diabetic patients and 50 healthy individuals as controls who visited the Yenepoya Medical College hospital and gave consent

were included in the study. Data was entered in excel and evaluated using SPSS software.

**Results:** MPV (10.05 fl vs 7.5 fl), PDW (16.9% vs 12.1%) and PLCR (26% vs 13%) was higher in diabetics than healthy individuals. PCT didn't show any difference between the two groups. MPV, PDW and PLCR showed significant variation with glycaemic index with a p-value <0.05.

**Conclusion:** MPV, PDW and PLCR showed significant increase with glycaemic levels and may indicate its association with vascular complications. Hence these parameters may provide a cost-effective way to assess the risk of vascular complications in diabetic patients in resource constraint settings.

**Keywords:** Glycaemic index, Microvascular complications, Platelet disorders.

## Exploration of the Antimicrobial Activity between *Sesbania grandiflora*, *Anacyclus pyrethrum*, *Moringa oleifera* and Cultivated Honey against Oral Pathogens for their Possible Role in the Control of Oral Infections: An In-vitro Study

Abstract-139

**G Jeevitha, MDS, Senior Lecturer, Department of Oral Medicine and Radiology, SRM Dental College, Ramapuram Campus, Chennai, India.**

**Introduction:** The prevalence of oral infections has risen many-fold in the last five years. Many oral infections like necrotising ulcerative gingivitis, necrotising ulcerative periodontitis, pericoronitis, herpetic lesions and oral manifestations of infectious diseases are managed with analgesics and corticosteroids only. The need for alternative herbal therapeutics is the need of the moment. *Sesbania grandiflora* is a potent antioxidant and antifibrinolytic. *Anacyclus pyrethrum* is an analgesic which can relieve pain and *Moringa oleifera* has significant antimicrobial and anti-inflammatory properties that leads to tissue repair. Honey is a potential alternative therapy, due to its ability to inhibit the release of TNF- $\alpha$ , IL-1 $\beta$ , and IL-6 free radicals and nitric oxide. It is soothing to the oral cavity and studies have stated that honey aids in rapid re-epithelialisation of oral mucosa. Present study planned to evaluate the antimicrobial synergy of *Sesbania grandiflora*, *Anacyclus pyrethrum*, *Moringa oleifera* and honey in different

dilutions. The results can help us apply the same synergistic formula in formulating an oral gel for the management of oral infections which can exhibit anticariogenic, antibacterial, analgesic, antioxidant and re-epithelialising properties. There are no studies that have evaluated the antimicrobial activities of this combination.

**Aims and Objectives:** To evaluate the anticariogenic activity against *Streptococcus mutans*, *Lactobacillus acidophilus* and *Candida albicans* of the synergistic combination of *Sesbania grandiflora*, *Anacyclus pyrethrum*, *Moringa oleifera* and cultivated honey.

**Materials and Methods:** The *Sesbania grandiflora*, *Anacyclus pyrethrum*, *Moringa oleifera* and honey samples were assessed for total phenolic content, total flavonoid content and pH level. The antimicrobial activity against *Streptococcus mutans*, *Lactobacillus acidophilus* and *Candida albicans* were performed for evaluating the

anticariogenic potency using well diffusion assays. The MIC, MBC values of the synergistic combination of herbs was evaluated.

**Results:** The herbal combination had high Total Phenolic Content (TPC) and Total Flavonoid Content (TFC) levels. Among the tested bacterial species, *S. mutans*, *L. acidophilus* and *C. albicans* were highly susceptible to the herbal combination. There was correlation between TPC, TFC levels and antioxidant levels.

**Conclusion:** The study results conclude that the synergistic combination of *Sesbania grandiflora*, *Anacyclus pyrethrum*, *Moringa oleifera* and cultivated honey had a high percentage of phytophenols,

flavonoids along with potent anticariogenic activity. This research opens up scope for the utilisation of the above combination as a therapeutic in the management of bacterial infections of the oral cavity. A synergy analysis using Fractional Inhibitory Concentration Index (FICI) is planned after this preliminary study. With the positive results of this study, a randomised controlled trial is planned with an experimental oral gel that can exhibit anticariogenic, antibacterial, analgesic, antioxidant and re-epithelialising properties against infectious oral lesions.

**Keywords:** Anticariogenic, Herbal therapeutics, Phytophenols.

## Exploring the Antibacterial and Antibiofilm Efficacy of Natural Compounds against Nosocomial Pathogens

Abstract-140

Pooja Rao, Jamuna Bai Aswathanarayan\*

Department of Microbiology, Faculty of Life Sciences, JSS Academy of Higher Education and Research, Mysore-570015, India.

\*Corresponding author: jamunabhounsle@jssuni.edu.in

**Introduction:** The utilisation of natural products as sustainable therapeutics has seen a rise in recent decades due to their rich array of bioactive compounds.

**Aims and Objectives:** This study investigates the efficacy of the two class of natural compounds for their antimicrobial and biofilm inhibitory activity.

**Materials and Methods:** The compounds used in the study are 1-acetyl-4-(hydroxyl phenyl) piperazine (DKP), a diketopiperazine derivative from marine actinomycetes and Usnic acid, a bioactive compound derived from the lichen *Usnea dasypoga*. These compounds have gained significant attention for their pharmacological potential. Despite its hydrophobicity and toxicity posing limitations to its biomedical application, this study explores the effectiveness of DKP and Usnic acid against nosocomial pathogens such as *Staphylococcus aureus* (ATCC MRSA-NR-46071), *Klebsiella pneumoniae* (MTCC-661 and a clinical isolate), and *Acinetobacter baumannii* in comparison with polymyxin B.

**Results:** The study reveals that usnic acid demonstrated a Minimum Inhibitory Concentration (MIC) of 0.12 mM for MRSA and 0.03 mM against the gram-negative isolates, whereas 1-acetyl-4-(hydroxyl phenyl) piperazine exhibited growth inhibitory activity at higher concentrations >1 mg/mL. Additionally, usnic acid displayed in-vitro biofilm inhibitory activity by impeding the adherence of pathogens to the substrate, with the highest inhibition observed against MRSA by 93% at 1 mM concentration, however the maximum biofilm reduction was achieved at 30% for the same concentration by the diketopiperazine. Confocal microscopy studies confirmed a significant disruption of biofilm architecture.

**Conclusion:** The ongoing work involves the preparation of a nano-formulation of usnic acid and diketopiperazine using encapsulation techniques to enhance therapeutic efficacy and overcome the challenges of hydrophobicity and toxicity. The resulting nano-formulation of bioactive natural compounds holds potential applications as coating agents and disinfectants as biomedical applications.

**Keywords:** Antimicrobial, Bioactive compounds, Usnic acid.

## Blood Transfusion Induced Neurological Deficits: A Case Study

Abstract-141

Yash Goel, Dhyuti Gupta, Prithpal Singh Matreja

Department of Pharmacology, Teerthanker Mahaveer Medical College and Research Centre, Moradabad, Uttar Pradesh, India.

**Introduction:** Posterior Reversible Encephalopathy Syndrome (PRES), a neurological condition diagnosed both clinically and radiologically, interestingly, can also develop after an episode of blood transfusion as well.

**Case Report:** A case of 64-year-old male chronic smoker who experienced PRES following whole blood transfusion. He was admitted for the management of progressive wound over lower limb and was detected to be anaemic for which he was advised multiple



transfusions. After one such transfusion, patient developed this neurocognitive disorder acutely.

**Discussion:** Acute haemolytic transfusion responses caused by immunological haemolysis can occur in people who do not have antibodies identifiable by regular laboratory testing. Whenever, a transfusion response is suspected/doubted, immediately stop the transfusion, and the in charge, needs to validate the patient's identity and do a clerical check by looking at the product bag. At periodic intervals, the patient's vital signs are required to be watched

and noted. The venous access should be maintained at all times for emergency management if required and the transfusion should be immediately discontinued.

**Conclusion:** Though this adverse event was well-managed conservatively and patient did not develop any sequelae, yet such incidences warrant a cautious account of incidences of haemovigilance in any healthcare setting.

**Keywords:** Acute haemolytic transfusion, Neurocognitive disorder, Posterior reversible encephalopathy syndrome.

# Antimicrobial Resistance Related to Lecithinase and Biofilm Production in Clinical Isolates of *Klebsiella pneumoniae* among Hospitalised Patients in a Tertiary Care Hospital, Puducherry, India

Abstract-142

**Kanimozhi Devanathan, Umadevi Sivaraman, Pramodhini Subramaniam**  
Department of Microbiology, Mahatma Gandhi Medical College and Research Institute, Puducherry, India.

**Introduction:** *Klebsiella* is a member of Enterobacteriaceae family that represents the normal flora of the human mouth and intestine. *Klebsiella pneumoniae* is one of the most pathogenic bacteria that is responsible for severe lobar pneumonia, urinary tract infections, meningitis (neonates), septicaemia, and pyogenic infections such as abscesses and wound infections. The factors that are implicated in the virulence of *K. pneumoniae* strains include capsular polysaccharides, lipopolysaccharide, fimbrial adhesins, extracellular exotoxins including enterotoxins, and cytotoxins, haemolysins, and siderophores. Biofilm forming bacteria are often seen on the surfaces of tissues and biomaterials at the sites of persistent infection. Lecithinase is an enzyme released by bacteria which have the ability to destroy host tissues.

**Aims and Objectives:** The present study aims to investigate the prevalence of Lecithinase and biofilm production in clinical isolates of *Klebsiella pneumoniae* in a tertiary care hospital at Puducherry, India.

**Materials and Methods:** A total of 200 clinical isolates of *Klebsiella pneumoniae* from various clinical samples collected during the

period from July 2020 to December 2020 was included in this study. Lecithinase and biofilm production have been detected by using egg yolk agar and test tube adherence method respectively. Antibiotic susceptibility tests have been performed by Kirby-bauer disc diffusion method as per Clinical and Laboratory Standards Institute (CLSI) guidelines.

**Results:** Out of 200 *Klebsiella pneumoniae* isolates, 138 isolates were from inpatients and 62 were outpatients. 103 isolates have been identified as positive for the lecithinase production and 84 isolates have been identified as positive for biofilm production. The antimicrobial susceptibility testing shows higher resistance on ceftriaxone/cefotaxime followed by cotrimoxazole.

**Conclusion:** The current study revealed the increased existence of lecithinase production, biofilm production and increased tendency of multidrug resistance among *K. pneumoniae* isolated from different clinical sources which is considered as a serious clinical threat that needs to be addressed to control its spread.

**Keywords:** Lipopolysaccharide, Multidrug resistance, Pathogenic bacteria.

# Assessing the Utility of Homoeopathic Remedy in a Case of Hypothyroidism: An Evidence-based Case Study

Abstract-143

C Rajalakshmi, Department of Repertory, Salem, Tamil Nadu, India.

**Introduction:** Homoeopathic medical science shows wonderful results in all the varieties of diseases. Imbalance in hormonal levels causes lots of diseases which are represented in the form of different signs and symptoms. Thyroid dysfunction is one of the biggest problems seen in the society – either patient with hypothyroidism or hyperthyroidism.

**Case Report:** A 40-year-old female patient came with complaints of mood swing during her menstrual flow in the past six months. She was very irritable, angered easily and desire to work always. Appetite was good but eating little satisfies her appetite. Thirst reduced only takes little. Stool constipated difficult to pass. TSH before and after treatment – 12 and 5 respectively. Zulewiks score before and after treatment -10 and 2 respectively.

**Discussion:** Homoeopathic medicine were found effective in controlling in symptoms and levels of hypothyroidism independent of hormonal replacement therapy as well as in add on to the hormonal therapy.

**Conclusion:** Homoeopathy not only treats the physical complaints but treats the patient holistically and as a whole. It resolves the mental trauma caused due to the physical complaints which master Hahnemann differentiated as somatopsychic disorders. Homoeopathy has its bang on results in autoimmune disease and can be treated as speedily as treated by other schools of medicine and in more gentle way with humanistic approach.

**Keywords:** Autoimmune disease, Homoeopathy, Humanistic approach.

# Serum Electrolyte Abnormalities among Type 2 Diabetes Mellitus Patients: A Case-control Study

Abstract-144

C Sandhiya, B.Sc. MLT (Intern), Department of Biochemistry, Government Stanley Medical College, Chennai, India.  
B Shobana, Assistant Professor, Department of Biochemistry, Government Stanley Medical College, Chennai, India.  
S Suganya, Postgraduate, Department of Biochemistry, Government Stanley Medical College, Chennai, India.

**Introduction:** Diabetes Mellitus is a disorder characterised by hyperglycaemia with various metabolic abnormalities. Electrolyte disorders are mainly encountered among hospitalised diabetic patients. They often lead to increased morbidity and mortality.

**Aims and Objectives:** To estimate serum electrolyte levels among hospitalised diabetic patients.

**Materials and Methods:** This was a cross-sectional study conducted over a period of six months. The sample size of the study was 100, which included 50 cases (Diabetes mellitus patients) and 50 controls (non diabetic healthy individuals). Serum samples were analysed for plasma glucose and serum electrolytes which included sodium, potassium and chloride levels.

**Results:** The study results showed no significant difference among serum sodium and serum potassium levels, but serum chloride levels were significantly higher among diabetic patients ( $p$ -value  $<0.05$  was considered significant).

**Conclusion:** Electrolyte abnormalities are to be considered during evaluation of patients with type 2 diabetes mellitus. Serum electrolyte levels should be measured promptly to detect various electrolyte disorders to reduce morbidity and mortality.

**Keywords:** Hyperglycaemia, Metabolic abnormalities, Serum electrolyte levels.

# Antibacterial Effect of Silver Nanoparticles Synthesised from Different Microorganisms

A Jamuna Bai, Meera K Nair, Sandra C Puthoor, M Keerthana Sudheer

Department of Microbiology, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India.

**Introduction:** Silver nanoparticles are nanoparticles of silver of between 1 nm and 100 nm in size. Silver nanoparticles (AgNPs) have been of the most attractive nanomaterials in biomedicine due to their unique physicochemical properties. The synthesis method of AgNPs include physical, chemical, biological routes. AgNPs are mainly used for antimicrobial and anticancer therapy, and also applied in the promotion of wound repair and bone healing, or as the vaccine adjuvant, antidiabetic agent and biosensors. The antibacterial effects of Ag salts have been noticed since antiquity. Ag is currently used to control bacterial growth in a variety of applications, including dental work, catheters and burn wounds. It is well known that Ag ions and Ag based compounds are highly toxic to microorganisms, showing strong biocidal effects on as many as 12 species of bacterial including *Escherichia coli* and *Staphylococcus aureus*. Reducing the particles size of materials is an efficient and reliable tool for improving their biocompatibility. In fact, nanotechnology helps in overcoming the limitations of size and change the outlook of world regarding science. The main stream recognition of the antimicrobial mechanisms of AgNPs include destructing bacterial cell walls, producing Reactive Oxygen Species (ROS) and damaging DNA structure.

Silver nanoparticles synthesised extracellularly from different microorganisms which include fungi such as *Saccharomyces cerevisiae*, *Saccharomyces boulardii* and *Fusarium oxysporum*. These are the organisms that can be easily available and cultivated by in-vivo and in-vitro. The antimicrobial activity of synthesised AgNPs was evaluated against both Gram positive and Gram negative bacteria such as *E. coli* and *S. aureus* by Kirby Bauer disc diffusion method. As a result, a zone of inhibition was observed against both test organisms, which indicated that synthesised AgNPs showing antimicrobial action against both test organisms so it may be inhibit the diseases caused by *E. coli* and *S. aureus*.

**Conclusion:** The AgNPs display bactericidal property against many pathogenic organisms. Silver has been generally utilised for curing infections, mending of wounds and treating diseases. AgNPs were also used for prophylactic treatment of ophthalmia neonatorum in infants. Because of the non harmful, safe inorganic nature, these silver nanoparticles been utilised for quite a long time and is equipped for killing around 650 microorganisms that cause infections.

**Keywords:** Antimicrobial activity, Biosensors, Nanomaterials.